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HENRY E. GARRETT

Professor of Psychology, Columbia University

President of the American Psychological Association, 1946

A DEVELOPMENTAL THEORY OF INTELLIGENCE¹

HENRY E. GARRETT

Columbia University

I THINK we will all agree that anyone who uses the noun "intelligence" owes it to his audience to explain exactly what he means by the term. This I fully intend to do. But I shall approach my definition somewhat obliquely, perhaps, by first explaining what I do *not* intend to mean by "intelligence." I know that there is some risk involved in using the indirect method. The elementary textbooks which begin by telling the student what psychology is *not* are often left with rather meager and uninteresting fare when it finally becomes necessary to inform the student what psychology *is*. In the same way, my definition, after I have drawn up a negative bill of particulars, may sound astonishingly trite and simple. In spite of these obvious hazards I shall, nevertheless, follow the indirect approach as I believe it involves a risk worth taking.

At the outset, I think we must discard omnibus definitions which include a little of everything. To illustrate, as recently as 1943 a well-known author (19) wrote that "intelligence is the ability to undertake activities that are characterized by (1) difficulty, (2) complexity, (3) abstractness, (4) economy, (5) adaptiveness, (6) social value, and (7) the emergence of originals and to maintain such activities under conditions that demand a concentration of energy and the resistance to emotional forces." This "definition," like the time-worn shot-gun prescription, can hardly fail to hit the trouble somewhere, but just *where* is not entirely clear. Omnibus definitions are in general too broad to be wrong and too vague to be useful. Again, I think we must avoid obvious and circular definitions. It is undoubtedly true that intelligence involves the ability to learn but our understanding is not greatly enhanced by saying so. Nor are we greatly helped by the oft-quoted cliché that intelligence is what the intelligence tests measure. The main and perhaps the *only* value in this smug (and I might almost say smirking) statement lies in the fact that it is "oper-

ational" in a loose sort of way. It is certainly not informative and was probably never intended to be.

With this long introduction over, I must now finally come to grips with the problem of formulating a positive definition. Omitting the qualification "general," intelligence as I shall use the term in this paper includes at least the abilities demanded in the solution of problems which require the comprehension and use of symbols. By symbols I mean words, numbers, diagrams, equations, formulas, which represent ideas and relationships ranging from the fairly simple to the very complex. For simplicity we may call the ability to deal with such stimuli *symbol or abstract intelligence*. This definition is essentially what Spearman meant by the eduction of relations and the eduction of correlates (18).

My own definition is by no means original nor is it particularly startling. Many years ago, Terman (20) defined intelligence as the ability to carry on "abstract thinking." As early as 1920, Thorndike (21) proposed that we recognize three levels of intelligence—the abstract, the social and the mechanical or motor. Thorndike's abstract level embraced essentially the activities which I have described above under symbol intelligence. It may be noted that Thorndike offered no proof for the existence of three kinds of intelligence:—adequate proof would, of course, be the demonstration of homogeneity among the measures on a given level, and of independence as between levels. Probably all that Thorndike really intended to do was to emphasize the fact that the biological notion of intelligence as adaptability to the environment is too broad to be useful and that, accordingly, it is more profitable to study individual differences in behavior within certain fairly well defined areas. Books, people, and machines constitute three sorts of things with respect to which it is important to measure a person's performance. These categories, to be sure, are not necessarily exclusive, nor do they run the gamut of human behavior. But they *are* important and they do cover a broad segment of life activities. More-

¹ Address of the retiring President of the American Psychological Association.

over, considerable experimental evidence for the existence of at least two levels (the abstract and the mechanical) can now be marshalled; and the social level might also be established if its constituents could be agreed upon and adequately measured.

At the risk of digression, it may be well to recall that the measurement of intelligent behavior began as a practical enterprise and that theory has in general followed rather than preceded application. Perhaps, had theory come first, we might have been saved much argument and many intelligence tests. The latter result would certainly have been a real contribution, but I am not so sure that the absence of controversy would have been a good thing. By actually measuring intelligence, however crudely, psychologists have been forced to set up theories in order to interpret what they have found. And eventually the impact of theoretical discussion has led to a better notion of what one is attempting to measure. Again, I would agree (5) that intelligence is in reality an *adverb* and not a *noun*. It has been said that we do not learn by doing, but that learning *is* doing. And by the same token, an intelligent person does not 'possess "intelligence" but rather exhibits the capacity to act intelligently (make a high score) when faced by tasks demanding the use of symbols (words, diagrams, numbers, mazes) in their solution.

It is the thesis of this paper that intelligence, as I have defined it, changes in its organization with increasing maturity. In 1938 (10) I proposed a differentiation hypothesis with respect to the growth of intelligence which I shall now present in greater detail. My hypothesis runs as follows: Abstract or symbol intelligence changes in its organization as age increases from a fairly unified and general ability to a loosely organized group of abilities or factors. If this hypothesis is true, the measurement of intelligence must perform change in its methods and objectives with increase in age.

Over a period of ten years and more, we conducted at Columbia University a long range program designed to test out the differentiation hypothesis. Our work has dealt for the most part with children of school age, as symbol intelligence is obviously not readily measurable until the child can use language with some facility. In the remainder of this paper I shall cite our own and other relevant data in support of the differentiation hypothesis. I shall

then try to present the implications of this formulation for mental measurement generally.

EVIDENCE FOR THE DIFFERENTIATION HYPOTHESIS

In a general way, our method has been (1) to analyze tables of intercorrelations for the presence of ability-clusters or factors, and (2) to study the changing relationship of such factors, i.e., their organization, with age. I shall first consider the results of four investigations carried out upon subjects differing fairly widely in age.

In a study of mental organization among school children, Schiller (16) administered 12 tests to 189 third and fourth grade boys, averaging nine years of age. Four of these tests were classified as verbal, three as numerical, and five as spatial-non-language. Evidence for the existence of ability-clusters described, respectively, as verbal, numerical, and spatial, appeared clearly in the correlation tables. There was, however, considerable overlap as between categories. The average correlation between the verbal and number tests, for example, was .63; between the verbal and spatial tests, .33, and between the number and spatial tests, .41. When the 12 test vectors were rotated into a three dimensional space by the centroid method of factor analysis, there was a clear separation of the verbal, number, and spatial test groupings. Since the reference axes were oblique, the three primary factors were of necessity correlated. Vectors through the verbal and number test clusters were close together so that correlation of the verbal and number factors was quite high (.83). The correlations of the verbal and spatial factors, and of the number and spatial factors were much lower (.27 and .30, respectively). From these results it seemed clear that at the nine year level, verbal and numerical tests taken together constitute a homogeneous general factor which is fairly independent of the abilities employed in the spatial tests. The high correlation of verbal and number abilities for nine year old boys is in interesting contrast to the r of .26 between the verbal and number factors found by Schneck (17) at the college level. Schneck's nine tests, five verbal and four numerical, were administered to 210 college men, 18 to 21 years old.

The same decrease in intercorrelation within a test battery as we go from children to adults is

found in the work of Bryan (4) and Anastasi (1). Bryan administered 11 tests of immediate memory to 100 five year old boys. The tests made use of pictures, objects, forms, colors, and blocks. All were given individually. For our purposes, the most significant finding is that these memory tests were as closely related to vocabulary (i.e., verbal ability) as they were to each other—indicating a considerable degree of homogeneity in the abilities utilized by these young children in dealing with symbols. In contrast, Anastasi's study of memory with adult subjects reports the correlation of the verbal factor with memory to be $-.085$; of the number factor with memory, $.00$. Anastasi administered four tests of memory, as well as two verbal and two number tests, to 140 college women, 16 to 28 years old. Anastasi also verified the low correlation for adults between verbal and number abilities found by Schneck, her correlation between these factors being $.24$.

These four studies agree in showing that for children, at least, skill in verbal and numerical tasks possess greater homogeneity than they do for adults. Other investigations have obtained essentially the same results. In Thorndike's CAVD, for example (22, p. 429), the correlation of level V (vocabulary) and level A (arithmetic) for 126 fifth grade children was $.52$, while the correlation between level V (vocabulary) and level A (arithmetic) for 100 college students was $.23$. In the same two groups the correlations between levels C (completion) and A (arithmetic) were $.64$ and $.23$, respectively. I have verified these correlations among the parts of the Thorndike CAVD examination in a group of 313 college freshman women (8). The correlation of levels A and V in this adult group was $.21$, of levels C and A also $.21$. The Thurstones have carried out two extensive investigations of ability organization at different ages. In one study (24) 60 tests involving words, numbers, spatial problems, diagrams, dot patterns, pictures, and mazes were administered to 1154 eighth grade children. By means of the centroid method of factor analysis, ten factors (later reduced to six primaries) were extracted from the correlational matrix. These factors were called, respectively, N (number), W (word fluency), V (verbal), S (spatial), M (memory) and I (induction or reasoning). Our present interest lies in the correlations found among the six primary factors. Some

correlation was to be expected among these factors since oblique transformations were used in rotating the test vectors. From the table of interfactor correlations a general factor emerged, called by the Thurstones "a second-order general factor," and identified by them as probably equivalent to Spearman's "g." This general factor was most highly correlated with the verbal and word fluency factors ($.715$ and $.615$) suggesting that it is intrinsically "linguistic." In a further study on a smaller sample of 438 children in which 21 tests selected from the original 60 were employed, the same second-order general factor again strongly emerged. Its correlations with the verbal and word fluency factors ($.676$ and $.686$) offer confirmatory evidence as to its linguistic and abstract nature and substantiate the first finding. The highest r in the second study was that between the general factor and induction or reasoning (namely, $.843$), the tests of which category demand the ability to understand and manipulate verbal symbols.

In an earlier study (23) of an older group, Thurstone administered 56 tests to 240 student volunteers, ranging in age from 16 to 25. The intercorrelations among the primary factors found in this study were quite negligible, the median of 72 r 's being $.03$ and the largest r $.24$. It should be noted that the intercorrelations of these 56 tests gave almost the same factorial matrix whether the transformations were oblique or orthogonal. It thus appears that the primary factors extracted are essentially independent and that no second-order general factor was present. As stated above, in the study of eighth grade children transformations were oblique rather than orthogonal. While the use of oblique reference axes makes correlation among the primary abilities inevitable, the fact that oblique transformations gave the clearest result (closest approximation to simple structure) suggests that the second-order general factor is not an artifact introduced by the method.

To sum up, it seems clear that when we compare the extent of generality in tables of correlations obtained from subjects well separated in age, greater differentiation appears at the upper age levels. Criticism may be made of this finding on the grounds that the tests employed at successive age levels were not identical (though they involve the same materials) and that sampling differences may account

for some or all of the difference found. Again, it may be argued that the use of oblique rather than orthogonal transformations allows the *method* rather than the data to determine the final result.

To meet these objections a second approach to the problem of changing mental organization with age can be made which will at least in part overcome these difficulties. This method is to compute intercorrelations of the same set of tests at successive age levels and note the change in correlations if such is present. Care must be exercised, of course, to have the subjects at different age levels comparable, and tests must have sufficient range to prevent skewness in the younger or older age groups.

Several comparative studies of this sort were included in our program. In 1935, Garrett, Bryan, and Perl (9) administered ten carefully selected tests designed to measure memory, verbal, and number abilities, to groups of public school boys and girls at three age levels. In all, 646 children were examined, 225 at age 9, 196 at age 12, and 225 at age 15. Considerable effort was made to obtain comparable samples; precautions taken to this end are given in detail in the monograph (p. 16-18). With one exception, the intercorrelations among the memory, verbal, and number tests showed a regular tendency to decrease with age from 9 to 12 and from 12 to 15. The average intercorrelation at ages 9, 12, and 15 were, for boys, .30, .21 and .18; for girls, .27, .30 and .10. A multiple factor analysis of the correlations at each age level—boys and girls kept separate—substantiated (as was to be expected) the correlational evidence. The proportion of variance accounted for by the first unrotated factor (roughly equivalent to "g") at ages 9, 12 and 15 was, for boys, .31, .32 and .12; for girls, .31, .24, .19. This regular fall in the trend of relationship with age was verified by Asch (3) who retested 161 of Schiller's subjects (originally tested at age 9) after a period of three years. From age 9 to 12 the average correlation for boys dropped from .56 to .41, for girls from .59 to .51; the correlation of the verbal and numerical tests dropped from .57 to .36 (boys) and from .64 to .49 (girls). Again we note a loss in generality with increasing maturity.

Two recent studies made upon different groups and with different tests substantiate further this general finding. In 1944 Clark (7) administered the Chicago Tests of Primary Mental Abilities to

320 boys, roughly 100 each at ages 11, 13, and 15. Subjects were drawn from the public schools and were from the same social and economic levels. Scores in each of six primary factors, V, N, S, W, M, and R, when correlated at each age level, showed a regular tendency to drop with age. Average factor correlations (excluding M which was very unreliable) were as follows at ages 11, 13, and 15: N and the battery, .55, .44, and .43; V and the battery, .62, .55 and .49; S and the battery, .48, .47, and .35. These results confirm the existence of the second-order general factor found by the Thurstones, and show, moreover, that it gradually weakens with age. Reichard (15) has in part verified Clark's findings, though the evidence from her work is not entirely clear. Reichard administered eight tests designed to measure verbal, numerical, and spatial abilities of 542 subjects, 280 girls and 262 boys, in public schools of suburban New York. Three age levels, 9, 12 and 15, were represented. Intercorrelations dropped sharply from age 12 to age 15 (.43 to .38 for the boys and .51 to .37 for the girls), but rose from age 9 to age 12—for both boys and girls. A reasonable explanation of this reversal seems to lie in the content of the tests which favored the nine year old group. This group, too, was probably somewhat superior to average nine year olds in performance level.

From these various studies I believe we can predict a steady drop in correlation among tests involving verbal, numerical, and spatial concepts from about age 8 to age 18. With increasing age there appears to be a gradual breakdown of an amorphous general ability into a group of fairly distinct aptitudes. It seems highly probable that maturation has much to do with this differentiating process, but increasing experience and diverging interests must also contribute heavily.

It is difficult to test out the differentiation hypothesis with the preschool child and with the infant. Tests at these early ages are of necessity concerned with physiological fitness and with muscular development and coordination. Baby tests, as we know, show little relationship to language tests of the school years (2), and hence with symbol intelligence. In the new born infant behavior is at first of a very generalized character. Jensen (11) writes "Stimulation of almost any group of receptors by almost any kind of stimulus will lead to a response

in almost any part of the organism that is set to respond." As the baby grows older, specialization and localization of movements begin to appear. This sifting out process is repeated, apparently, in the differentiation of intellectual activities which we encounter later on during the school years.

IMPLICATION OF THE DIFFERENTIATION HYPOTHESIS FOR THEORY AND PRACTICE

Implications for Theory. The differentiation hypothesis has implications of a theoretical as well as of a practical nature. On the theoretical side, it seems to effect a rapprochement between the Spearman General Factor and the Group Factor theories. Over the elementary school years we find a functional generality among tests at the symbol level. Later on this general factor or "g" breaks down into the quasi-independent factors reported by many investigators.

It seems likely that the "g" factor which appears strongly at the elementary school level is, in large part, verbal or linguistic in nature. If the school child can read well, he can very probably do the rest of his school work well. Solving arithmetic problems is contingent upon ability to read and understand directions; hence a fifth grade child high in verbal facility may do as well in arithmetic as a child of much greater native aptitude for numbers. This notion is not entirely speculative. Thurstone found that in the seventh and eighth grades his second-order general factor entered with greatest weight into the reading and composition tests. Kelley (12) reports the general factor to be stronger in power tests of reading and arithmetic for third than for seventh grade children. In the group of 126 fifth grade children mentioned above (21), the general factor in the CAVD had the following correlations with the four parts of the examination: with Completion, .90; with Arithmetic, .70; with Vocabulary, .86; and with Directions, .88. It is evident that the general factor at this age level is quite strong and is largely verbal. The "g" factor in CAVD for 313 freshman women (8) had correlations of .70 with Completion, .45 with Arithmetic, .74 with Vocabulary, and .76 with Directions. Although still verbal, the general factor is considerably weaker at this age level and is much less highly related to arithmetic. The conclusion which I draw from these data is that the overall ability ("g") which looms large during

the elementary school years becomes progressively less important at the high school and college level, where factor studies have shown it to be negligible or quite small.

It may be noted at this point that Thorndike's "quantity hypothesis" is not opposed to the differentiation hypothesis which I have suggested. Thorndike (22) in 1927 advanced the view that the difference in intellectual performance between the very bright and the very stupid person is not qualitative (involving new sorts of mental processes) but is quantitative (demanding more of the same thing). According to this view, the very intelligent person, then, has access to more numerous rather than to new kinds of connections. As evidence for his theory, Thorndike showed that for fifth and eighth grade children the intercorrelations among (1) tests involving routine information, and (2) tests involving generalization and relation finding, are no higher than the cross-correlations between the two batteries. This finding he takes as evidence of a basic continuity in function from the simple to the more complex symbolic activities. According to the differentiation hypothesis, this continuity arises from the common general ability which runs through intellectual performances at the elementary school ages. With increasing maturity and with a more nearly common background of language facility, general ability dissolves into more specialized talents or group factors.

Implications for Practice. The differentiation hypothesis has definite practical implication for the interpretation of intelligence test scores over a wide age range. The best individual tests of abstract intelligence (e.g., the Stanford-Binet) are most useful over the age range from 6 to 15 years. To know that a boy of 10 has a Stanford-Binet MA of 12 and an IQ of 120 is to have valid and useful information. From his MA and IQ we can predict how well this boy will do in school and how well he might do (if not seriously handicapped in other ways) in occupations requiring the comprehension and use of symbols in the solution of problems. I do not think that at the elementary school level we should attempt, except very tentatively, to fractionate the IQ into, say, language ability, number ability, reasoning and the like. The test items which might reasonably be classified under each of these heads are too few to permit a definitive judgment as to

specific abilities. This does not mean, of course, that for a given child one should not look for sharp deviations in performance upon significant items, or that one should not take note of the child's distinctive strengths and weaknesses in dealing with the test situations. But we should always remember that the total score on an individual intelligence test is a better measure of general ability than part scores on the same test can possibly be measures of more specific functions.

The group intelligence test is undoubtedly a useful means of classifying children according to degree of abstract intelligence. But I deplore the use of the IQ rather than the point score, say, to indicate performance on a group test—especially when the subjects are adults. The criteria which an intelligence test must meet in order to yield a numerically constant IQ have often been stated (14) but may usefully be repeated here. These conditions are (1) regular and progressive increase in the SD's of the MA distributions with increasing age; (2) homogeneity of function throughout the scale; (3) absence of correlation between CA and IQ. With perhaps a few exceptions, group intelligence tests do not meet these conditions even approximately. The Stanford-Binet does; hence the IQ in my opinion should be restricted to this examination. Much of the controversy concerning changing IQ's, inconstancy of IQ, etc., grows out of confusion concerning what the term actually means, and when it can justifiably be used. A recent pronouncement to the effect that education raises the IQ (13) was entirely fallacious because based upon changes in IQ's which were not IQ's at all but scores. No one would argue seriously that increased schooling does not in general lead to higher scores on *any* valid group test; but that such increases in score imply "true" increases in "intelligence" is certainly open to doubt.

At the high school and college levels, abstract intelligence breaks down, as we have seen, into a number of relatively independent factors. It would seem to be theoretically more defensible, therefore, and practically more useful, to measure verbal, numerical, perceptual or spatial ability, and perhaps other factors at these ages, than to give the subject a single over-all score. Perhaps some may wonder why, if this is true, total scores and not part scores were computed for the Army General Classification

Test. I believe that the use of total scores for the AGCT was justified by reason of the wide range in schooling (and presumably in abstract intelligence) reported by the 8,000,000 or so men who took this test. In large samples, correlations among the three parts of the AGCT were quite high, indicating substantial homogeneity within this examination. This probably resulted from the fact that many soldiers were undoubtedly closer to the elementary school child than to the superior adult in the facility with which they handled abstract test material. Correlations among the three parts of the AGCT would almost certainly be lower if computed separately for high school and college graduates.

Factor scores have been shown to be useful predictors of college achievement in science, literature, and other fields (6). For highly selected students the part scores shown on the profile of such a test as the Graduate Record Examination are more useful in guidance than is a single omnibus score. In the case of adults tests designed to measure aptitude for special kinds of work are to be preferred to blanket measures of general ability. Profiles are useful as one means of presenting the structural patterns which part scores exhibit. Such typology is at first primarily utilitarian—a useful scheme of classification—though it is to be hoped that more fundamental relations may eventually be revealed.

The trial and error period in mental measurement is, I believe, drawing to a close. Much progress has been made over the war years in the construction and use of mental tests. I think we can anticipate a bright future for psychometrics, and by no means the smallest achievement will be an increase in the number of valid tests capable of measuring precisely defined aptitudes and traits.

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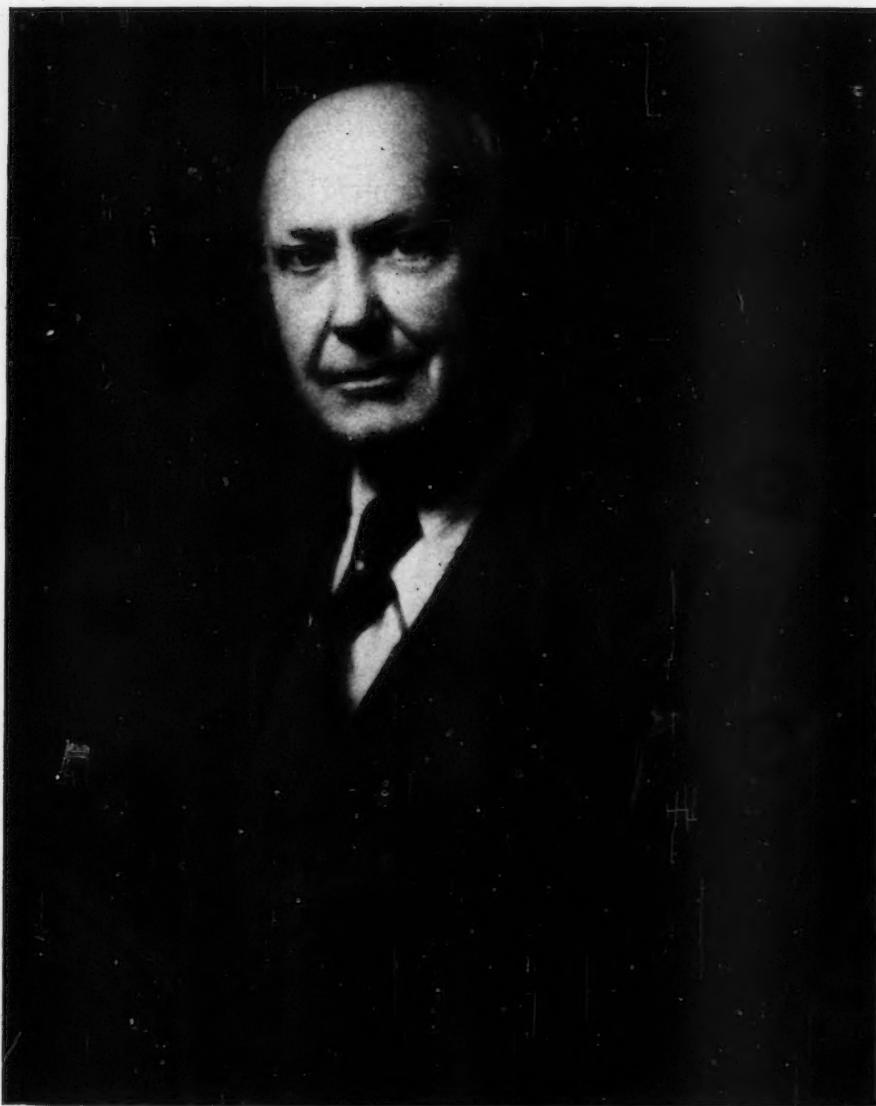
HONORARY DOCTORATES OF SCIENCE

At a special convocation on Thursday, September 5 the Trustees of the University of Pennsylvania honored six pioneer psychologists by conferring upon each of them the degree of Doctor of Science. We are grateful to the administrative officers of the University of Pennsylvania for their courtesy in allowing us to present the citations in this issue.



LEWIS MADISON TERMAN

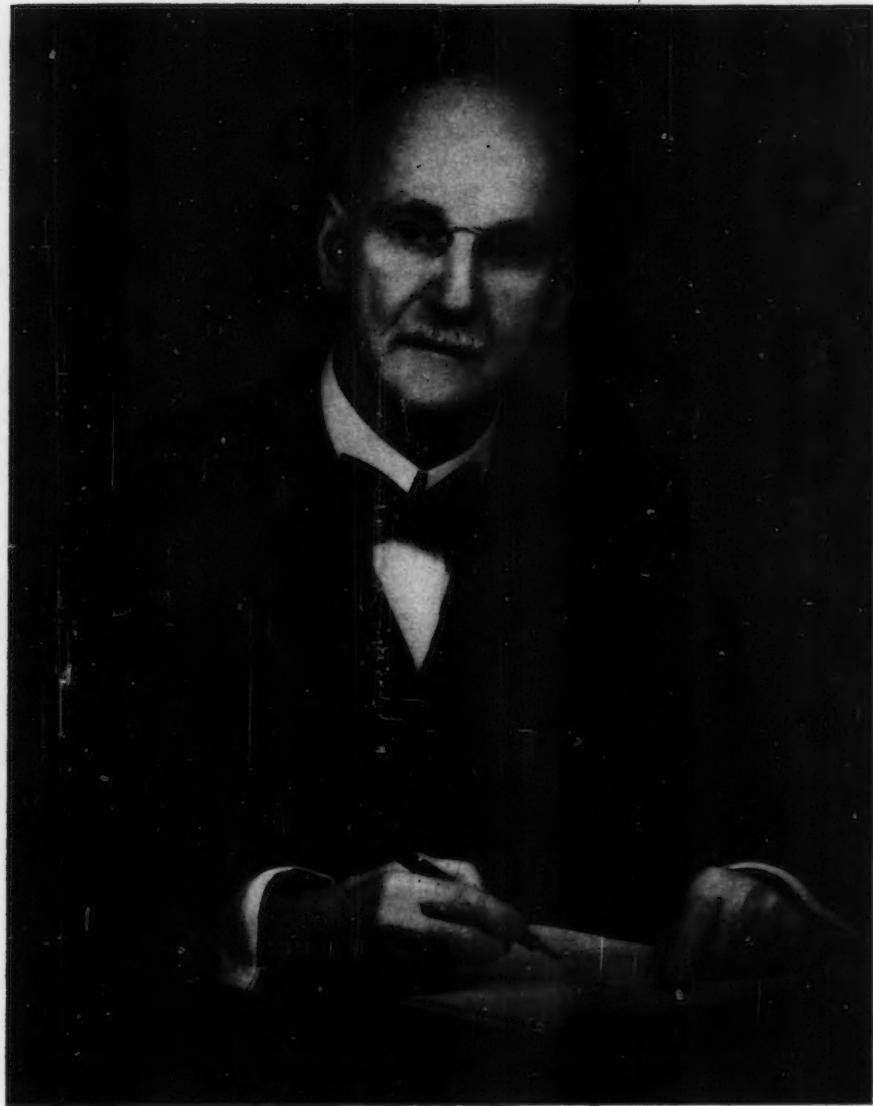
Graduate of Indiana and Clark universities and Emeritus Professor of Stanford University, former President of the American Psychological Association, member of that distinguished company of scholars, the National Academy of Sciences, and active in other scientific organizations, you have been a pioneer in the development of test procedures which have brought intelligence into the scientific measurement of intelligence itself. Your contributions have been of major import to the schools, the courts, the corrective institutions, and the clinics of the country. Your more recent interest in the detection, study, and development of gifted children has particular significance.



Blackstone Studios, 20 W. 57th St., New York

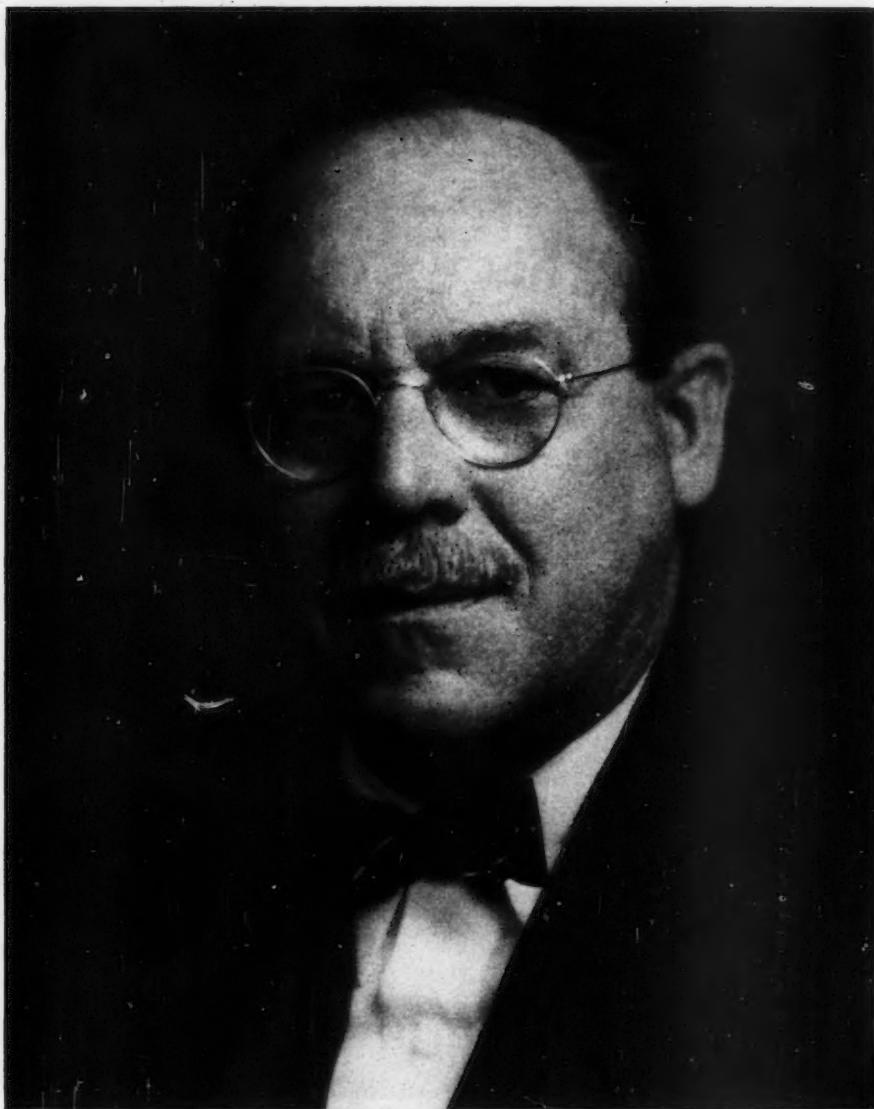
ROBERT SESSIONS WOODWORTH

Teacher, research scholar, author and editor, your education in the United States, Scotland, England, and Germany, and your wide knowledge have yielded handsome dividends to the advancement of scientific psychology through research and publication. You have been President of the American Psychological Association, Editor of the Archives of Psychology, Chairman of the Division of Anthropology and Psychology of the National Research Council and of the Social Science Research Council, and a member of many learned societies. Your teaching, productive scholarship, and writing have made you an outstanding figure in the development of systematic experimental psychology. Previously to your becoming Emeritus Professor of Psychology at Columbia University in 1942, for forty years as member of the Department of Psychology at that institution you steadily developed the influence of your chosen field.



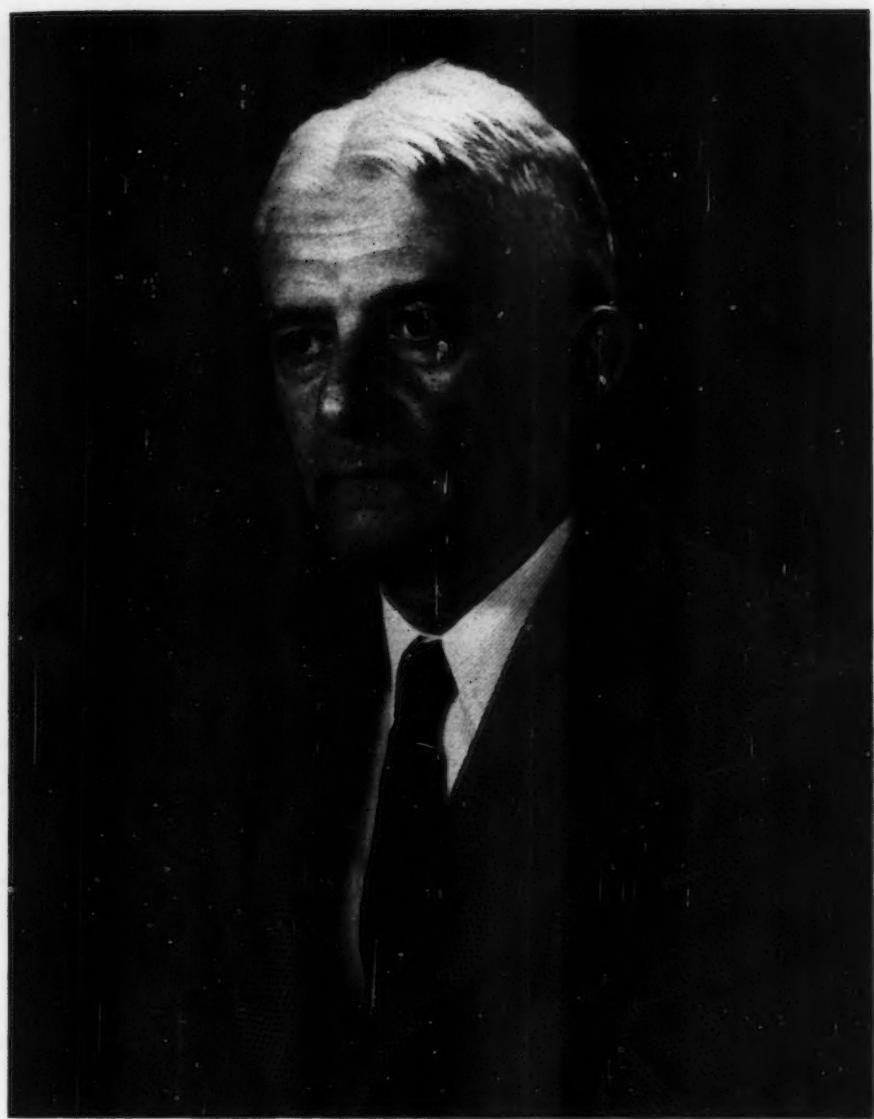
HENRY HERBERT GODDARD

Scientist, author, lecturer, graduate of our neighbor institution, Haverford College, and of Clark University and educational institutions abroad, member of scientific societies of this and other countries, you won early recognition as Director of Psychological Research at the Vineland Training School. After several years at the Ohio Bureau of Juvenile Research you were professor of abnormal and clinical psychology at Ohio State University. You have done definitive pioneer work in the clinical approach to the problems of feeble-mindedness—its detection, causes, and consequences—and in the training of feeble-minded children.



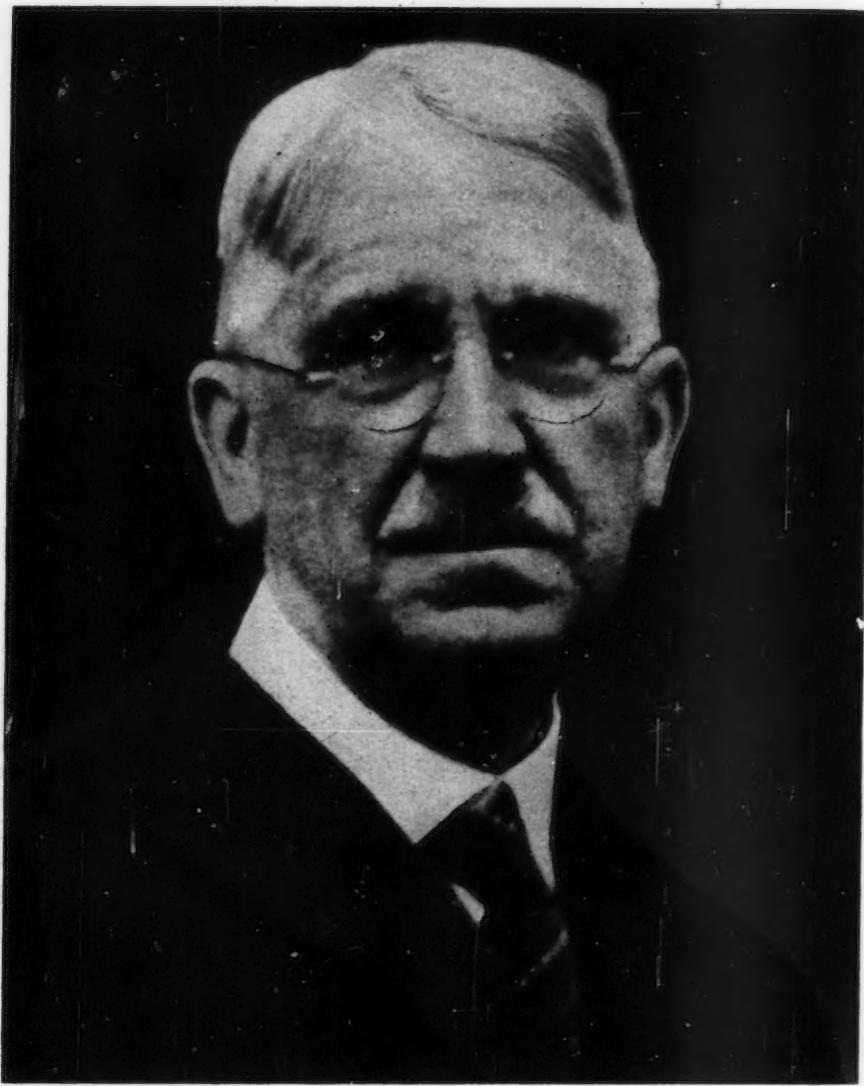
EDWIN GARRIGUES BORING

Native son of Philadelphia, you left this city to attend our friendly sister institution, Cornell, where you received your undergraduate and graduate education and began your career in psychology. You are a past president of the American Psychological Association, a member of the National Academy of Sciences, and an editor of the American Journal of Psychology. You have given your talents to the prosecution of two World Wars; your books have made available sound psychological facts and principles to officers and men and to returning service men. Your achievements in the fields of experimental and theoretical psychology and in the history of psychological thought and experiment have been major contributions to the growth of basic scientific knowledge.



WOLFGANG KÖHLER

Professor of Psychology at our neighboring educational institution, Swarthmore College, since your coming to this country from Germany, you have been active in the work of important scientific organizations here and abroad. You earlier had won distinction at Tenerife, Göttingen, and Berlin. You were one of the founders of the Configurational point of view in psychology, which has stimulated a new approach to experimental research and to the interpretation of experimental results in the fields of perception and thinking. Your work at Tenerife led to the development of new research methods for the study of the psychological processes of animals; at the University of Berlin you were Director of the Psychological Institute.



Press Association

JOHN DEWEY

Philosopher and scholar; trained at the University of Vermont and at Johns Hopkins University, inspired teacher at the universities of Michigan, Minnesota, and Chicago, you arrive at Columbia University early enough in your career to have added fine luster to its faculty as professor of philosophy for more than a quarter of a century. Your great contributions to education, philosophy, and psychology are so well known to all who read as to make it presumptuous even to enumerate them. We honor you, as we ourselves are honored, on this particular occasion primarily because your fundamental ideas and brilliant writings have been instrumental in developing the functional point of view toward psychology. You have further distinction as the sole surviving original member of the American Psychological Association, and as one of the organizers of that organization fifty-five years ago.

HISTORY, ORGANIZATION, AND RESEARCH ACTIVITIES, PSYCHOLOGICAL RESEARCH PROJECT (BOMBARDIER) ARMY AIR FORCES

STAFF, PSYCHOLOGICAL RESEARCH PROJECT (BOMBARDIER)

MIDLAND ARMY AIR FIELD, MIDLAND, TEXAS¹

THIS article is the eleventh in a series describing the Aviation Psychology Program of the Army Air Forces (1, 2, 3, 4, 5, 6, 7, 8, 9, 10). It describes the missions, history, personnel, and research activities of the Psychological Research Project (Bombardier) from its activation on 10 January 1944 until 31 December 1945 when its major war-time responsibilities had been met.

MISSIONS, HISTORY AND PERSONNEL

Missions

At the time of its activation in January 1944, three principal missions were assigned to PRP(B). These were (a) analysis of the job and study of criteria of proficiency for the selection of bombardier instructors, (b) performance of further and more complete analysis of the job of the bombardier student, including evaluative research on the various criteria of proficiency, and (c) such other psychological research problems as might be directed by Headquarters, AAF Training Command.

In March 1944 the first aspect of the mission was broadened to include the preparation of certain experimental instructor selection tests and the recommendation of tests to be included in a bombardier instructor selection test battery for use at AAF Redistribution Stations. In June 1944 research on measures of proficiency was focussed by a directive to develop (1) a bombardier final phase check which would serve as a final index of bombardier aerial proficiency and (2) comprehensive examinations to measure the practical knowledge of bombing (and

navigation) required of bombardier students about to graduate. In September 1944 PRP(B) was further directed to administer these comprehensive examinations to each class approximately two weeks before graduation.

In the late spring of 1945 the Project was directed to survey bombardier instructor proficiency by administering one of the current forms of the bombardier proficiency test to each aerial instructor and supervisor at the bombardier schools. In May 1945 the Project was directed to make a study of the improvement in bombing accuracy when the number of bombs dropped by each student in an experimental class was increased to 450 from the 159 then required.

History

The history of PRP(B) falls roughly into three somewhat overlapping phases: (1) orientation and preparation, (2) execution of the major missions assigned, and (3) preparation of a final comprehensive report of research activities.

The *orientation and preparation* phase, roughly from January to June 1944, was devoted chiefly to becoming familiar with the subject matter, the equipment, and the problems of bombing and to getting to know key training personnel, bombardiers, bombardier instructors, and supervisors. During this period a thorough job analysis of the bombardier aerial instructor's duties was made, the Opinion Questionnaire was developed (see Instructor Selection Test, Criterion and Validation Studies below) and a number of experimental instructor selection tests were administered and validated.

The second phase, *execution of the major missions assigned*, overlaps both the earlier orientation phase and the later report-preparation phase. During

¹This article was prepared by the Staff of the Psychological Research Project (Bombardier) and edited in the Psychological Section, Medical Research Division, Office of the Air Surgeon, Headquarters Army Air Forces, Washington, D. C.

this period the aerial phase check and the bombardier proficiency tests were developed and placed into use. Control statistics were maintained and group comparison statistics were reported at training conferences. The experimental class study was planned, and training of the class initiated according to plan by school training personnel under supervision of PRP(B) personnel. Training of this class was discontinued at the end of the war with Japan after only about 70 bombs per student had been dropped.

The third phase, *preparation of a final comprehensive report*, began in the fall of 1945. Early work on this report went along concurrently with the planning, supervision, and analysis of the data from the study of the experimental class.

Personnel

Throughout the existence of the Project, Major Edward H. Kemp served as director and Captain A. Pemberton Johnson as assistant director. These officers supervised the work of the Project. Other officers assigned for shorter periods were 1st Lieutenant William W. Grings, 1st Lieutenant Stanley F. Swenson, and 2nd Lieutenant Melvin J. Warrick. Lieutenant Grings was assigned to the project for 17 months, 8 of which he spent overseas with a research detachment studying combat criteria. He provided the detailed plan for and supervised the conduct of the experimental class study. During his 5 months of service with the Project, Lieutenant Swenson assisted Lieutenant Grings in conducting the experimental class study and devised a performance check for the A-6 bombing trainer to be used in that study. Lieutenant Warrick was assigned to the project for 9 months, and during that time he devised and developed the standardized flight check described in a later section.

The following enlisted personnel were permanently assigned to the project at various times:

Birch, Jack W.
Cozad, Lyman H.
Davis, Winifred S.
Hazen, Edward G.
Helmick, John S.
Hicks, Earl E.
Hirsh, Morris
Humphries, Charles H.
Knoderer, William H.

Levan, Kenneth B.
Lit, Alfred
McGrath, William Jr.
Myerson, Norman
Nasgovitz, John W.
Schwarz, Ralph H.
Scott, Charles B.
Stewart, Noel
Summers, Oliver H.

Kriedt, Philip H.
Larson, Robert J.

Tate, Edward R.
Wexler, Gerald

The average strength of the project during the three major periods was:

PERIOD	OFFICERS	ENLISTED MEN	CLERK-TYPISTS
10 January 1944 to 30 June 1944.....	2	6	1
1 July 1944 to 30 June 1945.....	3	11	1
1 July 1945 to 31 December 1945.....	3	11 ^a	1

^a Does not include 12 enlisted men on temporary duty with the experimental class detachment during August and September 1945

INSTRUCTOR SELECTION TEST, CRITERION AND VALIDATION STUDIES

Work on these studies was begun shortly after PRP(B) was activated. The first work comprised both formal job analysis of the duties and desirable characteristics of bombardier aerial instructors and considerable informal study of the personal characteristics of the returned-from-combat bombardiers sent to the Central Instructors School by the AAF Redistribution Stations. On the basis of this work several existing tests were chosen, and an attitude test and a bombing knowledge test were devised for experimental administration at the Central Instructors School. On the basis of validation data from this administration and the experimental administration of a number of tests at AAF Redistribution Station #2, Miami Beach, Florida, an instructor selection battery for use in all Redistribution Stations was chosen by a committee including representatives of the AAF Personnel Distribution and AAF Training Commands.

For continuing validation of the instructor selection battery, PRP(B) obtained two types of criterion data: instructor performance ratings and bombardier proficiency scores. The instructor performance ratings included overall instructor ratings by the Central Instructors School, "on-the-job" performance ratings by the cadets instructed, and officers' efficiency ratings. Performance ratings by supervisors and cadets (three or more cadet ratings combined on each instructor) were obtained by controlled interview from supervisors and from cadets

who had had direct experience, usually at least two months, with each particular instructor. The bombardier proficiency scores included scores on the final flight check and one of the bombardier proficiency tests developed by PRP(B). The validation results which were available at the end of the war are summarized in Table 1. Tests studied included cadet stanines,² an instructor stanine, and a number of separate test scores, some of which were

off-post life in small towns, the Army in general, and the like. The scoring key was determined empirically on preliminary groups, and validated on new groups.

f. *Personal Inventory*—a personal adjustment inventory, based on the NDRC inventory, made up largely of forced-choice items.
 g. *Scientific Background Test*—a general information test covering various fields of science.

TABLE 1
A summary of validation data on predictors of bombardier instructor criteria

PREDICTORS	CRITERIA											
	Instructors school		On-the-job									
	Overall instructor rating	N	r _{bis}	Supervisors rating		Cadets rating		Officers eff'cy rating		PRP(B) B. prof. test (Form C)		Standard phase check
				N	r	N	r	N	r _{bis}	N	r	N
Instructor Stanine.....	441	.54	101	.38	90	.61	101	.38	97	.36	64	.47
Bombardier Stanine.....	326	.11	149	.22	126	.16	353	-.03	214	.17	110	.14
Navigator Stanine.....	327	.26	148	.21	126	.23	354	.02	215	.23	110	.13
Pilot Stanine.....	107	.09	143	.21	122	.25	316	.00	192	.22	97	.25
Arithmetic Reasoning.....	95	.59	101	.21	90	.34	101	-.03			No Data	
Bomb. Basic Knowledge.....	121	.29	101	.34	90	.36	101	.36			No Data	
Explanation Blank.....	90	.26	80	.12	71	.14	80	.07			No Data	
Mech. Comprehension.....	122	.29	101	.18	90	.34	101	.30			No Data	
Opinion Questionnaire.....	124	.30	126	.56	90	.46	101	.43			No Data	
Personal Inventory.....	119	.19	101	.15	90	.16	101	.12			No Data	
Scientific Background.....	180	.27	64	.13	37	.43	41	.20			No Data	
Verbal Comprehension.....	122	.31	101	.11	90	.37	101	.19			No Data	

included in the instructor stanine. The tests may be characterized briefly as follows:

h. *Verbal Comprehension Test*—a test of comprehension of reading passages.

Though many of the groups for which data are reported in Table 1 are admittedly small, these results appear quite encouraging. The validity coefficients for the Instructor Stanine and the Opinion Questionnaire (which also entered into the stanine) are particularly encouraging. It should be noted that these positive results were in rather marked contrast to those obtained for pilots and navigators in other studies in the AAF Aviation Psychology Program.

DEVELOPMENT OF CRITERIA OF BOMBARDIER PROFICIENCY

A fundamental premise of the work in development of bombardier criteria was that the best qualified bombardiers not only were able to perform their

² A stanine is an aptitude score on a 9-point scale, representing a weighted composite of separate test scores.

aerial job well but also possessed a good practical knowledge of bombing equipment and of bombing theory.

Obtaining a satisfactory criterion of the aerial performance of the bombardier was the object of continuing psychological research dating from early 1941. Possible aerial criteria included record circular error or per cent hits, flight mission grades or ratings, and aerial phase checks (scorable checklists). A number of early and recent studies showed that neither record circular error nor per cent hits was wholly suitable as a criterion of bombardier aerial performance. It was found that their reliability approached zero for odd versus even missions of the same bombardier under normal training conditions. Moreover, bombardier training personnel and returnee bombardiers seriously questioned the validity of such accuracy measures alone, without considerable emphasis on proficiency in locating and identifying typical combat targets.

In the early days of bombardier training gross flight mission grades were sometimes assigned after "check-rides" by instructors or supervisors. These "check-rides" had never been standardized and they seldom provided either detailed or objective records of the bombardiers' performance. Under an earlier research program, Roger M. Bellows and Melvin J. Warrick developed a Flight Mission Rating Scale and analyzed data resulting from its use at one of the schools. Although undoubtedly an improvement over the flight mission grade slip used prior to that time, it proved to be so influenced by examiner variations that between-examiner reliability was low and its validity adversely affected.

On the basis of conferences with personnel in charge of bombardier training, it was decided to develop a final flight check for use in evaluating bombardier graduates. Reports indicated that in the European Theater of operations mission failures were due only in small part to inability of the bombardier to bomb accurately, and in relatively large part to inability to locate initial points and targets, faulty preparation for missions, inadequate preliminary checking of equipment (including bomb racks and releases) before the flight and on the mission prior to the central bombing run, and faulty procedure and judgment on the bombing run itself. Therefore in developing the final flight check, it was

designed to permit an evaluation of ability to avoid most of the types of failure mentioned above.

The first form of the flight check included a detailed check list of all items of procedure required of the bombardier during preparation and actual performance of a simulated combat (camera bombing) mission. Examiners were allowed to rate performance of each item on a scale of 1 to 5. Experience with this first form led to the rejection of this subjective rating scheme because of the usual difficulties with subjective ratings, and the adoption of all or nothing credit for the satisfactory performance of specific procedural items. This preliminary research also indicated the need for thoroughly trained examiners who had not been personally responsible for the instruction of the cadets whom they checked. Revisions were successively made in form and scoring procedure with the aid of a number of bombardier consultants, until in November 1944 a fairly satisfactory final flight check was supplied to the schools and to a carefully selected group of five examiners known as the Bombardier Training Standardization Board. Minor revisions, including specifying standards of acceptable performance on a number of items, continued until February 1945, when the final flight check and its score sheets were printed as a standard AAF Central Flying Training Command Form. The method of scoring the flight check was arrived at arbitrarily rather than empirically. This was unavoidable because of the short time allowed before the check, was officially put into use. Weights and pass-fail levels were assigned to individual sections and to the entire check on the basis of the expert opinion of those most familiar with its use.

About the time that staff training personnel of Headquarters, AAF Training Command became interested in the development of a flight check as a measure of aerial performance they also became interested in standard comprehensive measures of the practical bombing (and navigation) knowledge required of bombardier students. Several cadet schools had constructed one or more comprehensive ground school final examinations tailored closely to the subject matter taught in their schools, but no comprehensive examinations suitable for use in all schools of the AAF Training Command were available. Final ground school averages were the only officially recognized similar criteria in existence, and until late in 1944 these averages were based on dif-

ferent grading and weighting systems. Moreover the range of final average grades was small and the mean grades varied from school to school. In some instances the subject matter and its manner of presentation were markedly different from school to school.

The development of the bombardier proficiency tests served four functions for the Training Command, providing: (a) a single objective means of evaluating individual cadets, (b) a single objective means of evaluating individual *instructors or bombardiers on other duties*, (c) an objective measure of each bombardier school's effectiveness in imparting practical bombing or (navigation) knowledge to its graduates, and (d) a means of bringing about a greater degree of standardization among the schools. PRP(B) developed six bombing examinations and three navigation examinations to meet the various specific needs arising in carrying out the functions described above.

Multiple-choice tests and comprehensive examinations on bombing subjects had been in use several years before PRP(B) was activated. With the close cooperation of interested training personnel, PRP(B) gathered together probably the most complete file of Training Command and Air Force bombing examinations in the country. Meanwhile Project personnel, officer and enlisted, completed courses in the basic bombing subjects, received intensive training in use of the bombsight on the ground trainers, flew as observers on typical missions and participated in countless informal discussions with bombardier instructors, many of them former civilian teachers who had completed the 18-week bombardier course. By constant integration and re-evaluation of information from so many sources, Project personnel are believed to have developed a thorough and well-rounded understanding of the information basic to bombardier training.

Four specifications were set up, to be followed in the construction of both bombing and navigation examinations. (1) Each test item or set of items was to reproduce the actual situation in which the information or skill would be used as exactly and completely as the printed test method permitted. (2) Each item was to be technically accurate and expressed in the terminology currently prescribed by training manuals. (3) Each examination was to provide the most comprehensive possible coverage

of the basic subject matter of the training program. (4) Each examination was to be cast in objective, multiple-choice form, using standard IBM answer sheets.

In preparing the first bombing examination, reference was made to the file of about 2000 objective items which had been assembled from examinations used in the bombardier schools during the previous two years. Twenty-five or thirty key items were selected from this file and carefully revised to conform to the practical functional plan of the test. The remaining items were constructed by Project personnel and checked for technical accuracy with the aid of experts in each subject. As far as possible, unusual types of items were pre-tested on students of the AAF Central Instructors School for Bombing. New forms were devised in the light of statistical analyses and of the experience of Project personnel in administering earlier forms. In all instances time limits on the bombing examinations were set for the purpose of discouraging dawdling by the approximately 5 per cent of cadets last to finish. No part-time limits were used. The first 2 or 3 per cent of cadets to finish often took only slightly more than half the time allowed.

A number of problems were encountered in attempting to test the skills of aerial navigation realistically by means of a printed test. Problems arose from (1) the sequential nature of the operations in navigation, (2) the role of the navigator in directing and changing the course of the plane, and (3) the role of ground check points in certain types of navigation (i.e., pilotage). These factors made single, isolated printed test items somewhat unsatisfactory as representations of the navigator's task. In addition to information items about equipment and procedures and computation items calling for use of charts and computers, PRP(B) attempted to approach the characteristics of at least one type of actual navigation (follow-the-pilot dead-reckoning) by arranging series of items to represent successive operations in an actual mission. Various coding devices were used to permit recording an extended range of quantitative scores on standard IBM answer sheets.

Even though the final flight check provided some evaluation of a cadet's ability to identify properly several check-points and one target, this ability was deemed important enough to justify the develop-

ment of a separate measure of check-point and target identification. The most feasible approach appeared to be through the motion-picture medium. Accordingly, with the approval of Headquarters, Army Air Forces, a special motion-picture project was jointly initiated by PRP(B) and the Psychological Test Film Unit. Production of seven target approach runs comprising 25 items had been completed by the date of the surrender of Japan. These items, lacking the planned briefing material, were assembled in a demonstration form of this test which had appeared to offer much promise as a lead crew selection device.

SURVEYS OF STUDENT AND INSTRUCTOR PROFICIENCY

From September 1944 until mid-summer 1945, over 12,000 PRP(B) bombing or navigation examinations were administered by personnel of PRP(B), of the Airborne Testing Team (Radar) and of the Wing Standardization Board to approximately 7,500 bombardier cadets and approximately 3,100 bombardier instructors in the AAF Training Command. About 1,400 cadets took both a bombing examination and a navigation examination. Testing of cadets was done about two weeks before graduation at each school. Several thousand additional PRP(B) bombardier examinations were given by Psychological Research Project (Combat Crew).

The final phase check, requiring approximately four hours of flying by one examiner in checking two bombardiers, was administered by the Wing Standardization Board to 161 cadets and 234 instructors and training supervisors from November 1944 to June 1945. The results of administering these checks were tabulated and compared by PRP(B) personnel.

Comparative school standings for cadet classes and for instructors on the bombing examinations and on the final phase check and for some cadet classes on the navigation examinations were therefore available. Similarly cadet versus instructor comparisons were feasible. These comparisons were reported to school and to staff training personnel.

There is considerable indirect evidence and certain direct evidence that these surveys of student and instructor proficiency not only brought significant changes in training but resulted in improved proficiency of the graduates of that training. There is some evidence that the surveys of instructor pro-

ficiency aided school training officials to maintain or even exceed the original level of instructor proficiency in spite of a rapid turnover of instructor and supervisory personnel in the first half of 1945.

THE EXPERIMENTAL CLASS

Early in May 1945 PRP(B) was directed by Headquarters, Army Air Forces to conduct a study of the improvement in bombing accuracy (circular error) occurring when the number of bombs dropped in the bombardier training course was extended by 100, 200 and 300 over the then current requirement of 159 bombs per student. Rather than complete the various stages of the standard program of training and then drop 300 more bombs, it was planned to extend each stage of the aerial learning situation so as to include for each set of conditions far more bomb releases than the minimum current training requirements. The first bombs were dropped under conditions planned to be as nearly optimal as possible, to facilitate the maximum amount of initial learning.

One hundred men, selected from a volunteer group about twice as large, in such a way as to include about equal numbers of students with high and average bombardier stanines, formed the experimental class. A separate squadron was designated to conduct their aerial training. The objectives of the experiment were explained in considerable detail to students, bombardier instructors, and pilots in that squadron. Their motivation and interest in the experiment appeared unusually high.

An incidental study involved learning on the latest type of ground trainer prior to the first aerial bombing. Accuracy scores on this trainer were found to have high reliability, but the data did not permit the segregation of differences due to personnel and differences due to apparatus. If trainer differences are found to be small or can readily be corrected for, trainer scores will provide a promising proficiency measure early in training.

Only two different aerial conditions were studied before the changes in training plans following the surrender of Japan forced cancellation of training for this class. Although the uncertainties of that period caused several interruptions of training, seventy bombs were dropped by each student before training ended, nearly all at a bombing altitude of 7000 feet and the remainder at 4000 feet. Careful

plans were followed to equate or to measure the major factors known to affect bombing accuracy but not under the control of the individual student. Students were assigned to flights by means of random numbers and similarly paired for assignment to instructors. Pilots and airplanes were assigned numbers and project personnel daily scheduled flight combinations of airplane, pilot, and student pairs. Pilots and airplanes were systematically rotated so that each student pair flew with each pilot in each aircraft approximately the same number of times. Perfect rotation was impossible because reserve airplanes sometimes had to be substituted for airplanes found to be operating unsatisfactorily on last minute checks, and because of certain unavoidable turnover of instructor and pilot personnel. Bombsights remained installed in one airplane for about fifteen days, then were routinely inspected and reinstalled in a different airplane. More frequent rotation was not feasible. To minimize the effect of turbulent air all missions were flown in the mornings; the assignment of half the class to the early morning missions and half to the late morning missions was alternated every three days. Turbulence measurements for each mission were made in a specially equipped "turbulence airplane" which flew over the targets with the bombing aircraft.

Four methods of scoring bomb impacts (including bombardier's estimates of circular error) were studied and found to correlate highly with each other, the correlations ranging from .94 to .97. Constant errors did not exceed 4.4 feet although the average absolute difference between individual pairs of measures was 12 to 15 feet.

Using bombardier's estimate of circular error (the only record available for every bomb), class averages for each bomb dropped at 7000 feet were computed and plotted as a learning curve. Similarly the six bombs dropped at 4000 feet were plotted in a second learning curve. Learning occurred very rapidly at both altitudes. When these students were given somewhat more than the usual amount of instruction on the improved bombing trainer and were allowed to begin aerial bombing under optimal conditions, a very short period of time was required for the attainment of a high level of bombing accuracy and a plateau beyond which no further improvement occurred. The rapid learning under the 4000 foot

altitude condition suggests that other variations in the conditions could also be learned rapidly.

A number of bombs dropped after the class as a whole had reached a plateau were studied to ascertain the reliability of circular error by bombardiers and the effect of various factors on circular error. Randomization and rotation of pilots, planes, sights, and early versus late morning missions is believed to have minimized the influence of other factors on circular error differences among bombardiers, but the reliability of bombardiers' circular errors computed by various splits was no greater than had been found in earlier studies. Although with the small number of bombs dropped, as compared to the number planned for, it was not possible properly to counterbalance the several major factors studied, bombsights appeared to vary among themselves somewhat more consistently than either pilots, bombardiers, or airplanes.

In summary, under the conditions maintained for the experimental class, bombardier students reached their maximum level of proficiency in target bombing very quickly. Once this level was reached, the differences between individuals appeared to be due largely to factors other than individual proficiency. The most consistent systematic source of variance appeared to be the bombsight.

FUTURE RESEARCH

With the rapid development of new instruments, new weapons, and new tactics, it is difficult to predict what the future holds for the job specialty of bombardier. However, all these changes will raise new psychological problems in the selection and training of personnel and in the design and use of equipment. Present AAF plans call for the training of all members of the bombardier-navigator-radar observer team at one training station. Psychological personnel located at that station will have responsibility for maintaining an integrated research program on problems related to all this group of job specialties.

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A YEAR OF STATE CERTIFICATION OF PSYCHOLOGISTS

WALTER R. MILES

Yale University

THE Board of Examiners of Psychologists,¹ appointed by His Excellency Governor Raymond E. Baldwin in July 1945, to carry out the provisions of the Connecticut law for certifying psychologists, has just rendered its first report. The Connecticut legislation, known as Public Act #257, went into effect July 1, 1945, and during the fiscal year ending June 30, 1946, the Board certified fifty-one psychologists. Their names appear below in alphabetical order.

Altmaier, C. L., Jr.
Ames, Louise B.
Barrett, Dorothy Moss
Bechtel, Helen W.
Becker, Harry A.
Bills, Marion A.
Bousfield, W. A.
Burnham, Paul
Challman, Robert C.
Child, I. L.
Clarke, Frances M.
Coffin, T. E.
Couey, Fred
Conver, Bernard J.
Cutts, Norma E.
deCillis, O. E.
Feingold, G. A.
Feldman, Estelle E.
Fischer, Liselotte
Flemming, Edwin G.
Gagne, Robert M.
Habbe, Stephen
Hagman, Elizabeth
Hagman, Elmer
Hamrick, Randall B.
Heiser, Karl F.

Herrington, Lovic Pierce
Hovland, Carl
Hutt, R. B. W.
Keller, Margaret V.
Kennedy, Margaret V.
Kurtz, A. K.
Kurtz, Josephine
Levine, Jacob
Maltby, Jane Merriam
McClelland, David C.
Miles, Catherine
Miles, Walter
Mote, F. A.
Orbison, William
Page, Howard E.
Porter, E. L. H.
Rogers, Lawrence S.
Sarason, Seymour
Scott, Cecil Winfield
Stanton, Mildred
Tallman, Gladys
Thompson, W. A. P.
Tilton, J. W.
Wittenborn, John R.
Zehrer, Frederick A.

Section 5 of the Act provides certain conditions under which the Board may certify during the first two years. Within this period, the qualifications which concern age, moral character, and United States citizenship are not relaxed, but the Board may, at its discretion, waive either the written examination or the requirement of the doctoral degree in psychology (or education), provided that the candidate clearly qualifies by experience to practice psychology. Therefore, within the two-year period, the passing of a written examination is definitely required for certification of any candidates lacking the doctorate. In the past year's experience there were only two such cases.

Seven meetings were held during the year, all in Hartford. The Board found that the Act was so clear and well-worked out as to occasion little difficulty in determining its policies. However, the experience the Board has had so far has brought out the need for the adoption of two added policies which appear to be in line with the spirit of the Act and worthy of record. First, the Board has adopted the position that it should consider applications only from psychologists who either reside or practice, or both, in the State of Connecticut. It is operating under a state law and proceeding on the basis that its sphere of operation should be limited to the state within which the law is enacted. While some psychologists out of the state might be benefited in certain ways by certification under the Connecticut law, such a practice might, at the present time, impede the enactment of appropriate laws in other states. Second, during the two-year period law, the Board is not inclined to provide the written examination for candidates without the doctorate unless their graduate training approximates the Ph.D. course requirements.

So far we have no occasion for regretting the provisions and wording of the Act which the 1945

¹ Drs. Marion A. Bills, Secretary, Stephen Habbe, and Walter R. Miles, Chairman. Dr. Karl F. Heiser was a member at first. After his resignation, due to plans for an extended mission abroad, Governor Baldwin appointed Dr. Stephen Habbe in his place after September, 1945. At some of the board meetings, other psychologists have been invited in for counsel as occasion seemed to warrant.

Assembly adopted; but, on the contrary, congratulate ourselves that it was so well designed.

Those who are interested in the cost and mechanics of certification may wish a few figures. The fee for certification is \$15. This is a one-time fee. There is no renewal fee. The gross income for the fiscal year has, therefore, been \$765. The expenses have not been so large as might be imagined. The printing of application blanks, stationery, certificates, the making of the seal, the lettering of certificates, supplying mailers and postage has cost in round terms \$135, leaving a balance of \$630. Expenses have been relatively small due especially to the fact that it has been found unnecessary to set up an office, and clerical help has been supplied gratis through the kindness of the secretaries who usually serve the members of the Board in other capacities. The Board is small and travelling expenses for the members have been minimal due to the nearness of their several residences.

The form of the certificate, which measured 8½ by 11 inches, and its wording, are exhibited in the reproduction shown below. Its modest dimensions facilitate framing or filing according to the recipient's inclination. In granting a certificate the Board sends an accompanying letter signed by its chairman which contains the following two para-

graphs, the intent of which needs no comment in this journal.

"It is a pleasure to send you the enclosed certificate indicating that you have met the requirements under the provisions of Public Act #257 (1945) of Connecticut, and that you are authorized to be known as a Certified Psychologist. The possibility of your being so certified has resulted from discussion, planning and cooperation between members of the Connecticut Valley Association of Psychologists, the Connecticut State Psychological Society and concerned forward looking citizens and legislators of the State.

Recent years have witnessed a rapid growth in technical and professional services of a psychological nature in connection with business, industrial organizations, hospitals, clinics and various state and federal institutions. Some who are poorly trained attempt to enter this new professional field. It is desirable to set up in the public mind high standards of training, experience, and technical knowledge as expected qualifications for such service. "Certified Psychologist" should become a standard mark of merit. The meaning and public repu-

(Concluded on page 401)



State Board of Examiners of Psychologists

BE IT KNOWN THAT

Karl F. Heiser, Ph.D.

has met all of the requirements under the provisions of the Statute Law of this State and is hereby authorized to be known and designated as a

CERTIFIED PSYCHOLOGIST

and is given the right to use said title or the initials "C.P." as he may elect.

In Witness Whereof, the Board of Examiners of Psychologists grants this certificate Number 3 under its Seal and Signature on Aug. 30, 1945

Walter B. Miller, Stephen Haber, Marvin Miller
STATE BOARD OF EXAMINERS OF PSYCHOLOGISTS

THE CERTIFICATION OF CLINICAL PSYCHOLOGISTS IN VIRGINIA

ON MARCH 26, 1946 the Governor of Virginia signed State Senate Bill No. 237, the purpose of which is "To provide for the determination by an Examining Board created for the purpose of the qualifications of clinical psychologists, and their certification by the Commissioner of Mental Hygiene and Hospitals; and to impose penalties for serving or holding one's self out as competent to serve as a certified clinical psychologist in violation of the provisions of this act." In view of the current concern of the psychological profession regarding standards of clinical competence and legal status, we believe that a description of this bill and its companion bill and a review of their history will be of interest and value to many.

The initiation and development of this legislation is to be credited principally to members of the Psychology Section of the Virginia Academy of Science. Prior to and during the 1944 meeting of the Section there had been considerable discussion of the general problem of improving the training of psychologists working in the more applied fields. The whole discussion came to focus in the immediate matter of the training and certification of clinical psychologists. The chairman of the Section, David K. Spelt, acting with the advice of the Executive Committee, shortly thereafter appointed Mrs. Dorota Rymarkiewiczowa as chairman of a special committee on training and standards and empowered her to complete the membership of this committee.

As the culmination of informal conversations among interested psychologists and psychiatrists in the state, some fifteen psychologists were invited to meet at the University of Virginia early in the summer of 1945. Fortunately, there were among those present some who knew from first-hand experience the kind of difficulty that had beset the psychologists of several other states in their attempts to enact and administer legislation bearing on this problem. Certain general principles involved in setting the standards themselves, as well as the possible lines of action for bringing them to legal reality, were considered at some length. Shortly thereafter the Committee on Training and Standards (John N.

Buck, Frank W. Finger, Cecile B. Finley, David K. Spelt, and Dorota Rymarkiewiczowa) convened in formal session, to put into definite form the ideas that seemed gradually to be crystallizing as majority opinion.

The first item on the agenda was the formulation of a set of standards for certification that would be reasonably adequate and at the same time not unduly optimistic. It was finally decided that three measures of professional competence should be demanded: a doctorate in psychology, five years of acceptable clinical experience, and satisfactory performance on an examination to be set by an Examining Board. The Board was also empowered to evaluate as equivalent other educational and experiential qualifications. The Examining Board itself was to be selected by the Executive Committee of the Psychology Section of the Virginia Academy from among members of the American Psychological Association; three of these members were themselves to be certified clinical psychologists, and two were to be instructors in nonclinical psychology on the faculties of Virginia institutions of collegiate standing. The inclusion of the nonclinical members, incidentally, was due to the insistence of the clinicians themselves, who felt (a) that those actively engaged in academic work would be in a better position to evaluate educational qualifications, (b) that a mixed committee might serve to minimize the current trend of divergence between clinical and nonclinical psychology, and (c) that the articulation between clinical training and academic training might through these contacts be effected more satisfactorily.

After these basic decisions had been expressed in tentative written form, it was in order to plan a campaign to put them into effect. We were particularly fortunate in three respects. There had been for some years a section in the Code of Virginia providing for the approval of "Mental Examiners" who might be called upon to serve on commissions in cases involving alleged mental deficiency. Our proposal could thus be presented as an amendment to an already existing statute. The Commissioner

of Mental Hygiene and Hospitals for the State felt that he was in no position to approve such Mental Examiners on the basis merely of their ability to administer "the Binet-Simon test or other approved mental tests" (the sole legal requirement). He had already requested assistance in this matter from the psychologists of the State, through one member of our Committee on Training and Standards. Several influential psychiatrists in the State were strong supporters of clinical psychology, and were eager to cooperate in a reasonable program. It was therefore decided that before the proposed changes in the existing law were presented to the Legislature, the psychiatrists in the State should be taken into consultation.

The first step, however, was to seek the approval of the membership of the Psychology Section. On July 28 we sent a mimeographed copy of the proposed legislation to each member, with a covering letter explaining its necessity, and a postcard ballot for an expression of opinion. Within two weeks a majority of the group had replied, unanimously in favor of the action. Feeling thus that we were speaking for the psychologists of the State, we approached the psychiatrists by sending copies of the proposal to the Commissioner of Mental Hygiene and to another key psychiatrist, who in turn presented it for consideration to the Virginia Neuropsychiatric Society and to the Mental Hygiene Association, with favorable recommendations. The president of the former organization, Dr. D. L. Harrell, immediately appointed a committee to deliberate upon the matter, including Commissioner H. C. Henry (succeeded shortly by Dr. D. C. Wilson), Dr. J. K. Hall, and Dr. Finley Gayle. It might be stated that one of these three psychiatrists was in virtually complete agreement with the proposal from the start; it soon became apparent, however, that a joint committee meeting would be necessary. Due to a combination of circumstances this meeting could be scheduled no earlier than December 10th, and then could be attended by only one psychologist and two psychiatrists. It developed that this was quite adequate, and the differences of opinion were in reality so slight that they were adjusted with mutual satisfaction. The psychiatric committee reported favorably to the Neuropsychiatric Society which then went on record as supporting the proposal. The proposed legisla-

tion, now slightly revised from its original form, thus was given the stamp of approval by organized medicine within the State, and from that time on the psychiatrists were unflagging in their efforts to assist in its passage.

The next task was that of overcoming legislative inertia. A copy of the proposed amendment was sent on January 8, 1946 to State Senator Morton Goode, the chairman of the State Hospital Board, with an explanatory letter. He in turn passed the material on to the Legislative Committee of the Board. This board, through the good services of interested psychiatrists, decided to back the measure. In the latter part of the month two of the psychologists met with the newly appointed Commissioner of Mental Hygiene and Hospitals, Dr. J. E. Barrett, to discuss the form in which the proposal should be stated. It was arranged at this time that Senator Goode and Senator Hagood (a physician) would sponsor the bill, after it had been phrased in legal terminology by the technical experts of the Senate. This final shuffling found the proposed legislation in the form of two companion bills; No. 237 described the process of certification, and No. 238 amended the existing section of the Code by substituting the phrase "certified clinical psychologist" for "Approved Mental Examiner" in regard to the determination of feeble-mindedness. Due to the legislative urgency of the situation, no check was made by the psychologists on this last step, with the unfortunate result that the slightly archaic qualification of "skill in making the Binet-Simon test" is still included. On the other hand, the substance of the ideas expressed by the committee of psychologists in July 1945 had been preserved virtually intact in spite of the successive linguistic transformations. The bills were introduced into the legislature on February 18th, with a hearing before the Senate Committee on General Laws scheduled for February 25. In the intervening week the psychologists discussed the matter with several of the senators, including the two physician members, and arranged for the psychiatrists who had favorably considered the proposal to present their views to the senate committee, either in person or in writing. The hearing itself turned out to be a mere formality, with the Commissioner of Mental Hygiene and one other psychiatrist relieving the three psychologists present of the necessity of speaking.

The committee promptly voted to report the bills. They were presented on the floor of the Senate, passed unanimously, sent to the lower chamber, and again were accepted without dissenting vote. Shortly thereafter they were enacted into law with the signature of Governor Tuck.

Senate Bill No. 237 reads as follows:

Be it enacted by the General Assembly of Virginia:

Section 1. Examining board created.—There is hereby created an Examining Board for the Certification of Clinical Psychologists, hereinafter referred to as the Board or the Examining Board, to consist of five members to be selected by the executive committee of the Section of Psychology of the Virginia Academy of Science. Two members shall be chosen from and shall be members of the faculties of the accredited colleges and universities in the State, and shall be actively engaged in teaching non-clinical psychology; and three members shall be certified clinical psychologists who have had at least five years of clinical experience, three years of which shall have been spent in an approved Mental Hygiene Unit. Each member of the Board shall be a member of the American Psychological Association.

Section 2. Terms of office.—Original appointments to the Board shall be for terms as follows: one certified clinical psychologist for a term of one year, one non-clinical psychologist for a term of two years, one certified clinical psychologist for a term of three years, one non-clinical psychologist for a term of four years, and one certified clinical psychologist for a term of five years. All subsequent appointments shall be for five year terms. Vacancies shall be filled for the unexpired terms, and members shall serve until their successors are appointed and have qualified. Only clinical psychologists shall be appointed to succeed clinical psychologists, and only non-clinical psychologists shall be appointed to succeed non-clinical psychologists.

Section 3. Organization of Board; use of records.—The Board shall annually elect one of its members to serve as chairman, and the chairman shall appoint a secretary whose duty it shall be to keep the minutes and other records of the actions and deliberations of the Board. The Board shall adopt a seal, and rules and regulations for its own proceedings and government, and for the examination of candidates for certification as provided herein. The official records of the Board shall be available at all times for inspection by the Commissioner of Mental Hygiene and Hospitals to aid him in determining the fitness of any candidate for certification.

Section 4. Meetings of Board; examinations.—Regular meetings of the Board shall be held at such times and places as it prescribes, and special meetings may be held upon the call of the chairman or any two members, but there shall be not less than one regular meeting each year, at which meeting candidates applying for certification shall be examined and their qualifications determined.

Section 5. Qualifications of candidates.—A candidate for certification as a certified clinical psychologist who on the effective date of this act does not hold a certificate as an

Approved Mental Examiner, shall, in order to be recommended for certification by the Board, produce satisfactory evidence that he

(1) Is of good moral standing;

(2) Holds a doctorate in psychology, including graduate courses in clinical, experimental, and physiological psychology and statistics.

(3) Has had five years actual experience in clinical work, at least three years of which have been in an approved Mental Hygiene Unit, and at least one year of which has been under the direct supervision of a certified clinical psychologist and a certified psychiatrist; provided that the Board may accept other academic training and experience as the equivalent of that prescribed herein;

(4) Is competent from a clinical standpoint, as shown by passing such examinations, written or oral, or both, as the Board deems necessary.

Any candidate meeting these requirements shall be recommended by the Board to the Commissioner of Mental Hygiene and Hospitals who, in his discretion, may issue a certificate to such person as a certified clinical psychologist. The Commissioner of Mental Hygiene and Hospitals may also issue a certificate as a certified clinical psychologist to any person who on the effective date of this act holds a certificate as Approved Mental Examiner, provided such person applies for such certificate within one year after such date. The Commissioner shall present to the Board a statement in writing of the grounds on which a certificate is refused to any person recommended by the Board.

Section 6. Penalties for violations.—Any person serving or practicing or holding himself out as qualified or capable of serving or practicing as a certified clinical psychologist without having complied with the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than fifty nor more than five hundred dollars for each offense.

Senate Bill No. 238 requires in essence that a certified clinical psychologist be summoned, whenever practicable, "to act in place of a physician as a member of any commission for determining the mental condition" of certain individuals.

It may be said, in summary of this legislation, that psychologists in Virginia are given no legal privilege or responsibility beyond those previously enacted, although their use in court is more strongly urged. The committee feels, however, that a major step forward has been made toward raising the status of the profession in the State. A very definite specialty has been legally recognized, high standards of training and competence have been established, and there has been put into the hands of the psychological profession the power of determining who can and who cannot lawfully claim himself to be a "certified clinical psychologist." With judicious application

of this power, high quality performance in the name of Psychology can be expected with increasing confidence, and as time goes on, duties more commensurate with proven ability may be assigned by law to the clinical psychologist.

The experience of guiding this legislation through its several stages of development has made it clear to the committee that, at least in this state, there need be no clash of interests between the psycholo-

gists and the psychiatrists. In this very practical legislative matter only a confusion in terminology separated the goals of the two groups, and once this was clarified a completely cooperative effort was forthcoming. Judging from this demonstration and from the verbal expressions of the medical group, there is every reason to believe that the high calibre application of clinical psychology will be welcomed by the psychiatrists of Virginia.

The Committee on Training and Standards, Psychology Section, Virginia Academy of Science

JOHN N. BUCK

CECILE B. FINLEY

DAVID K. SPELT

DOROTA RYMARKIEWICZOWA, *Chairman*

FRANK W. FINGER, *Secretary*

STATE CERTIFICATION REQUIREMENTS FOR SCHOOL PSYCHOLOGISTS

JOHN E. HORROCKS

Ohio State University

THE purpose of this survey was to learn the situation obtaining in the several states relative to the certification requirements for school psychologists. Of late there has been increasing interest in the licensing or certification of psychologists. Since it is common practice to require certification of school personnel, it might be assumed that provisions would be made for certification of school psychologists if general provision was made to employ persons in that capacity.

Letters were sent to the state departments of education of the forty-eight states requesting information concerning the provision made for the certification of school psychologists or some similar position, and the nature of the requirements for certification if they existed. If a state did not certify school psychologists, a description of any plans for doing so was requested.

Forty-two states answered the letter. Replies were not received from Arkansas, Florida, Iowa, Montana, Nevada, and New Jersey. An inspection of the returns shows that only seven states certify school psychologists. They are Connecticut, Indiana, Maine, Nebraska, New York, Ohio, and Pennsylvania. Six states—Illinois, Kansas, Louisiana, Utah, Wisconsin, and Wyoming—make provisions for certification for some types of psychological work, but not for school psychologists as such. Three states, Wisconsin, West Virginia, and Utah, are planning to institute certification requirements for school psychologists. The remaining states make no provision for any kind of psychological personnel.

Of the seven states certifying school psychologists, New York, Connecticut, Pennsylvania, and Ohio have set up the most comprehensive requirements. New York defines the duties of a psychologist as "subject to the direction and supervision of the superintendent of schools, to examine children, by individual psychological tests, for ungraded classes,

classes of mentally retarded or gifted children and other special classes in which general or special mental abilities of the pupils are main factors; diagnose learning difficulties of children and suggest remedial treatment; investigate causes of personality and social maladjustments; supervise the diagnostic and remedial measures and procedures used by teachers and supervisors in overcoming the learning difficulties or social maladjustment of pupils, and advise and assist teachers and supervisors in the application of such measures; give pupils individual instruction in overcoming learning difficulties or other maladjustments and advise supervisors, teachers and parents with regard to the kind of instruction given to said pupils; confer with teachers and parents with regard to the learning and behavior problems of children; advise teachers, principals and the superintendent of schools with regard to all matters relating to psychological problems of children; and do related work as required." Both a provisional and a permanent certificate are granted. The provisional certificate requires "a four year curriculum leading to the baccalaureate degree (or approved equivalent preparation) and, in addition, 30 semester hours in approved graduate courses leading to the master's degree with a major in psychology; the total program of undergraduate and graduate preparation shall include 40 semester hours in approved professional courses." The permanent certificate is granted when an applicant has completed twelve graduate hours in psychology beyond the master's degree. The holder of a permanent certificate "shall during each successive ten-year period from date of issuance complete six semester hours in approved courses or the equivalent in approved and appropriate professional activity...." The program must be selected from the fields listed in Table 1.

Pennsylvania issues certification for public school psychological examiners and for public school psychologists. Certification as a public school psy-

chological examiner or public school psychologist requires graduation from an approved college or university, and the completion of 36 or 66 semester hours of work, respectively, before or after graduation.

Connecticut certifies three types of psychological personnel—examiner in training, psychological examiner, and school psychologist. The examiner in training must be a college graduate with 15 semester hours in psychology and education and at least six semester hours in psychological testing. He must also have a recommendation from the institution granting the academic credit that he is qualified to begin work in psychological testing and must declare his intention to undertake the entire training leading

aminer and must have had five years of successful experience in psychological testing as well as three years of study in the special field.

Ohio issues three types of certificates for school psychologists. The four-year provisional certificate as Junior School Psychologist is granted to those holding the master's degree in psychology from an approved school provided the candidate holds, or is eligible to hold, a teaching certificate valid in social studies, has at least 20 semester hours in specified psychology courses, and has completed 300 clock hours of "practical experience under expert supervision." The eight-year professional certificate as junior school psychologist will be issued upon evidence of 24 months of successful experience as Junior School Psychologist, or equivalent experience, under the above four year provisional certificate. The Permanent Certificate as School Psychologist will be issued upon evidence of 40 months of successful experience under the eight-year certificate and possession of a Ph.D. or Ed.D. degree in psychology conferred by an approved institution. Present plans call for certain changes in the above requirements, particularly in regard to teaching certification.

Nebraska simply requires a school psychologist to be a graduate of a four-year college teacher training course with specialization in the field of psychology. Maine also requires four years of college training with specialization in psychology, but does not require the college to be a teacher training institution. Indiana reports that it has no certification pattern, but evaluates the credentials of each individual who applies.

Of the remaining six states which provide certification for some kinds of psychological work, but not for the school psychologist as such, there does not appear to be any commonality. Illinois and Kansas certify high school teachers of psychology whose function is classroom teaching and nothing else. Such teachers must have basic education courses, and in the case of Kansas, 20 hours of psychology. The Wyoming elementary school counselor must be a college graduate who has taught in elementary school for three years, has administered at least 50 tests, and has completed 24 hours in specified psychology, 18 hours in measurement, three in counseling, and three in education. The proposed Louisiana requirements for the teacher of exceptional children are mostly educational in nature but include basic

TABLE 1

FIELDS	SEMESTER-HOUR RANGE
Advanced Psychology (non-specialized).....	3-8
Experimental psychology (a lab. course).....	3-8
Psychology and methods of teaching.....	4-8
Problems or principles of education or school administration or educational sociology.....	2-6
Educational measurement and statistics (including mental measurements).....	4-8
Psychology of learning and growth.....	4-8
Psychology of adjustment problems.....	12-20
Clinical tests and procedures (including instruction in the application of standardized, individual tests).....	3-8
Clinical experience under qualified supervision.....	4-8
Physical bases.....	6-8

to a certificate as psychological examiner. The psychological examiner must be eligible for the training certificate and in addition have completed at least 30 hours of graduate work in psychology and education. Of the 45 hours required, 27 must be in general professional training and 18 in specific professional training. The specific training is defined as "training under close supervision in psychological testing and study of the individual child, the interpretation of the results of this study, in the light of the case history of the child, and submitting reports." The candidate must also present evidence of having given tests of mental ability and educational achievement for five years. To be certified as a school psychologist the candidate must have completed the requirements for a certificate for psychological ex-

psychological background for such specialists as the teacher of blind children, the teacher of mentally deficient children, the teacher of delinquent and neglected children, etc. Wisconsin certifies a school psychometrist who must have completed 30 semester hours of graduate work including 24 hours of psychology and education. In addition, the psychometrist must have had three years public school teaching experience and "one year's successful experience in the field under approved supervision." Utah certifies a first and second class coordinator. The first class coordinator must be a college graduate with 30 hours in education and allied subjects plus 14 specified hours in psychology and sociology.

Of the three states which are contemplating certifying school psychologists, Wisconsin and West Virginia merely report that they are planning some day to set up requirements for a school psychologist. Utah has already received a report from a special committee which was appointed to study the certification requirements for counselors, and which will be

considered by the State Certification Committee in the near future. Utah proposes to have a first and second class counselor. A first class counselor would be required to have a teaching certificate, three years of teaching experience, a master's degree or other approved graduate work beyond that completed for a teacher's certificate, and special training in the various areas of counseling procedure and practice.

At the present time it appears that the position of school psychologist either does not occur in most school systems or else it is occupied by a person who may or may not be a properly qualified psychologist. In all probability many such appointments are teachers who have not had specialized training. But there is a trend in the direction of certification. The information given here may be of value relative to the future of certification of psychologists and as an aid to those who have as their duty the vocational counseling of persons wishing to enter the field of school psychology.

(Continued from page 394)

tation of this certificate depends upon the quality of work and professional ethics of those who bear it."

Finally, in what types of jobs do the certified psychologists of Connecticut work? It is unnecessary to make a detailed analysis, but they may be grouped under five general categories. Six psychologists are employed in state and federal institutions, including hospitals; fifteen in community guidance and vocational counseling services; four in non-state hospitals and clinics; six in business and

industrial organizations; twenty in academic, that is, college and university positions, where they teach applied psychology broadly considered and/or do some consultative work as specialists in psychology. The Board is of the opinion that the wording of the Connecticut law permitting the certification of all qualified psychologists is commendable. The experience of the first year in the operation of the Connecticut law is favorable and we trust useful for the profession.

A NOTE ON FISSION

DAVID KRECH

Swarthmore College

THE spectre of fission is haunting academic psychology. And there is much viewing-with-alarm and the shaking of heads. In some instances it appears that this fission between "experimental" psychology and "professional" psychology is merely a way out of administrative, personality, or political difficulties,¹ and in some instances this fission is defended on the grounds of some basic differences which are said to exist between the two fields of work. But whatever the ascribed cause, all academic psychologists express profound regret at this tendency. Curiously enough, the teachers of both professional and experimental psychology agree that such a split is bad for *professional* psychology.

The reason for this unanimous viewing-with-alarm seems to be this: All agree that every student—whether he is destined to become a pure psychologist or an industrial, clinical, or social psychologist—must first be given some training in experimental psychology. This good, basic fundamental, solid, scientific (these seem to be the accepted adjectives) training is supposed to provide the professional psychologist with a helpful set of integrating concepts and, above all, an appreciation for, an insight into, and a familiarity with the "scientific research method". And everyone further agrees that the scientific research method is the *sina qua non* for good work in any field.

All teachers of psychology, it appears, thus seem to believe that the student who concerns himself, for a year or so of graduate work, with such problems as *An Experimental Investigation of the Law of Effect in the Maze-Learning of the Albino Rat*, *The Effect of Interpolated Activity on Retention of Nonsense Syllables*, *Excess Motivation and Insight Learning in the Dog*, and *Organizational Factors in the Perception of Unfamiliar Line-Drawings* will thereby obtain the appreciations for, the insights into, and the famili-

¹ It is interesting to speculate whether these psychologists are here showing a high degree of transfer from their war-time Washington experience where administrative or political difficulties in a Bureau or Department always meant a "re-organization".

arity with the concepts, problems, and proper experimental techniques for the study of learning, memory, motivation, perception, etc. Since all the problems which the professional psychologist is apt to meet in industry, the clinic, or the public forum involve learning, memory, motivation, and perception, this basic training should be very helpful.

As Gardner Murphy recently pointed out² it is assumed that there is a high degree of transfer from familiarity with the experimentalist's problems to work in the fields of attitudes, worker-morale, propaganda, attitude-testing, feeding problems in children, etc. There are no sound data to support this assumption of a high degree of transfer. Why, then, this unanimity among psychologists that a basic foundation in experimental psychology is desirable for the training of the professional psychologist and that a formal separation of the two is to be regretted? One can offer at least two hypotheses:

The first hypothesis (and I hasten to interrupt my sentence to say that I am merely offering this as a logical possibility—I don't believe it applies) might be called a special instance of a myth about group belief or Look-The-Emperor-Has-No-Clothes-On Error. This hypothesis would argue that most psychologists really don't believe that experimental psychology has very much to offer professional psychology. But because most psychologists have been indoctrinated with the official ideology that experimental psychology is good and sound and scientific, and because of the desire of most psychologists to remain members in good standing with the scientific universe with which they have identified themselves, they are somewhat reluctant to make a public confession of their heterodoxy. The result is that a condition of pluralistic ignorance obtains—no one believes, but everyone believes that everyone else believes. What is needed, according to this hypothesis, is some innocent to proclaim in loud tones that the emperor *has* no clothes on, and imme-

² At the April 1946 meetings of the Eastern Psychological Association's panel on the training of the professional psychologist.

diately all the psychologists will quickly disavow the notion which they don't really believe anyway.

The second hypothesis is that despite the absence of good supporting data, most psychologists *believe* that there is a high degree of transfer or, what is more probable, they feel that if there is no high transfer, there *should* be and so they're willing to take a year out of their students' time in the hope that this time transfer will occur.

The following suggestions are offered for consideration by those psychologists who ally themselves with the second hypothesis. I confess that I am one who views the splitting tendencies with alarm, and the proposals outlined below are addressed to the problem of increasing the degree of transfer from training in experimental psychology to work in professional psychology.

I think it might be helpful to look more closely at what an experimental psychologist is. I would like to suggest that we make a distinction between a "pure" pure experimentalist and an "applied" pure experimentalist. I shall define a "pure" pure experimentalist as one who is primarily interested in psychological experimentation only insofar as it sheds light on *systematic scientific concepts*. I shall define an "applied" pure experimentalist as one who is interested in experimentation primarily because it will help answer a specific question he wants answered *regardless* of whether or not the answer has any systematic conceptual value. Both are "pure" psychologists in the sense that scientific curiosity and not immediate and practical considerations drives them to the laboratory.

Thus, in animal experimentation, there are the "pure" pure psychologists who are concerned with the problems of learning, memory, insight, perception, motivation, etc. I want to repeat: they are system builders, they are interested in these concepts as "cosmic" concepts, not as "rat concepts" or "monkey concepts". They first formulate a general psychological hypothesis, and *then* they survey laboratory facilities and if they find rats, they work on rats, if they find raccoons, they work on raccoons, etc. In many cases the specific animal used is quite irrelevant. They *use* the beasts to seek answers to their questions. The conclusions they draw are not dependent, they hope, on the nature of the beast, but on the nature of psyche.

But some animal psychologists are "applied" pure

psychologists. These experimentalists are not interested in conceptual systems but are concerned with the rat *qua* rat, with the monkey *qua* monkey, with the duck *qua* duck. They enter the laboratory to seek answers to such questions as "Does the *albino rat* have color-vision?" or "What is the range of the *dog's* auditory sensitivity?" The conclusions they draw, they hope, derive from the nature of the beast.

But this is not the whole story, nor are the implications which are suggested by the above dichotomy entirely fair. The "pure" pure animal psychologist is dependent on the "applied" pure psychologist for facts which he must have before planning his theoretically-pregnant experiment, and the data of the "applied" pure psychologist are frequently *directly* useful for systematic conceptualizing. In addition, and this is of great importance, both of these experimentalists use the same experimental techniques and the same rigorous scientific controls and analytic procedures.

There are certain epi-phenomena resulting from the work of the "pure" pure experimentalists which are of some significance. This experimentalist, because he does choose the rat (irrelevant though this is to his main concern) as his experimental subject, and because he does spend the best years of his life feeding rats, handling rats, cleaning rat-cages, building rat-mazes, being bitten by rats and being frustrated by rats, ends up with a great deal of practical knowledge about rats. Quite incidentally to his pursuit of principles of psychology, he ends us as a good applied rat psychologist. I have frequently been more impressed by the skill with which my colleagues and I have been able to handle the sharp-toothed rat than I have with the psychological truths we have managed to formulate on the basis of our experiments. In any event, the "pure" pure rat psychologist ends up with a very few valuable concepts, some good experimental techniques and procedures for working with rats, and a considerable store of intuitive knowledge on how to make friends with and influence rats. Of course only the first of these accomplishments justifies a life-long devotion to *Mus Norvegicus Albinus*.

The same is true for other "pure" pure psychologists. The experimentalist in perception, in addition to his systematic gains, learns a great number of ingenious tricks and cute ways with bits of colored

paper, rheostats, color-filters, motors, paper-clips, india-ink, etc.

I think there is a parallel between all of the above and the problems facing the experimental and professional psychologists. And there is a moral, a challenge and a promise in this parallel.

Why should the experimentalist who is primarily interested in the validity of the Law of Effect and who is not at all interested in rats, continue to work with the rat-in-maze? He must, if science is to advance, remain "pure" and continue to grow gray before his time worrying about the validity of the Law of Effect, but why cannot he use people in significant social contexts as his experimental situation? His publication might now be called *An Experimental Investigation of the Law of Effect in Attitude Formation Among Republicans*. Why doesn't the perception experimentalist title his work *Organizational Factors in the Perception of Racial Grouping*?

Because of the danger of misinterpretation, I wish to repeat: this is not an appeal to the experimental psychologist to concern himself with important social issues. He should continue to formulate his "pure science" problems as problems in "pure science" but instead of using the irrelevant rat, or the irrelevant nonsense syllable, I am urging him to use the equally irrelevant (for him) man in an important social situation. This is an instance where a change from one irrelevancy to another, becomes very relevant. Two "side effects" would follow. First, the "pure" psychologist, because he would be working with people in significant situations, because he would have to "dirty his hands with people", because he would have to coax people and motivate people and be frustrated by people might, conceivably and quite incidentally, learn about people instead of about rats and bits of Hering papers. But that to some is perhaps of minor importance. Secondly, however, his students while learning the basic lore about the Law of Effect and Relational Determinism would be learning scientific techniques, methods, and ways of reasoning which would be directly transferable to their work with people in important social contexts as industrial psychologists, clinicians, and attitude

surveyors. And this is an immediate and important desideratum if experimental psychology is to contribute basic concepts and scientific guidance to professional psychology.

There would still remain an important difference between the experimentalist and the professional psychologist. The experimental psychologist, to return to our examples, would still ask the question "What is the nature of the organizational forces in perception?" and his research results in the perception of racial groups would still be couched in systematic, scientific, generalized conclusions. The professional psychologist might ask the question "Do five-year-olds in the New York City Schools in 1946 perceive the Jews as a special group?" His conclusions might have only immediate practical value, would derive from the nature of five-year-olds, from the nature of the New York City Schools, and from the nature of 1946 and not be applicable, perhaps, to ten-year-olds in Cuba in 1950. But both the experimentalists and the professional psychologists would have common techniques, material, experimental problems, etc. And what the psychologist as a graduate student learned about experimental work in perception would stand him in immediate use in his work as a professional psychologist employed by the Mayor's Inter-Racial Committee.

I think I am aware of all the objections which the experimentalist can raise to this proposal. I have used these objections myself in time past. All of the objections have the prestige which comes with age, many of them are valid, but some of them are merely confessions of inertia, laziness, or lack of ingenuity. Not all theoretically important problems can be investigated with human material in important social contexts. The experimental material is not always irrelevant. We will still need rats and cockroaches and bits of colored paper. We will still need the very simple situation, the easily controlled situation, the cleverly contrived problem-box. But some of our important "pure" experimental work can be done with material that is "practically" important. It will be difficult, but it can be done and is very much worth doing.

STUDENT AFFILIATES IN THE APA

UNDERGRADUATE and graduate students in psychology are now for the first time in the history of the American Psychological Association eligible to become actively identified with the national organization as Student Affiliates. Under the new constitution of the APA a standing committee on Student Affiliates was created for the purpose of encouraging student psychologists to participate in the activities of the APA. Students are not only eligible to become affiliated with the APA but are urged to identify themselves with the national association early in their educational careers—earlier than was possible heretofore. For the annual fee of \$5.00, a Student Affiliate receives a copy of the *Yearbook* and subscriptions both to the *AMERICAN PSYCHOLOGIST* and the *Psychological Abstracts*. Membership privileges are reserved however, to Associates, Fellows, and Life Members.

The Committee on Student Affiliates, consisting of Stuart W. Cook, Francis P. Robinson, Robert C. Tryon, Beth Wellman, and the writer, Chairman, is of the opinion that a significant and healthful development for American psychology will result from the encouragement of outstanding students majoring in psychology to affiliate with the APA as early as their senior year of undergraduate work. Student Affiliateship is an honor, and one of the best ways to stimulate such affiliation is for departments of psychology to designate each year their outstanding students as acceptable candidates.

The Committee on Student Affiliates during the past months has considered the necessary implementation of procedures for Student Affiliateships. It has reached unanimous agreement on several propositions. First, as for the endorsement of a student for Student Affiliateship, the Committee agrees that the endorser shall be (a) a Fellow of the APA or (b) the chairman of the department of psychology in which the student is working, provided, however, that said Chairman is an Associate or Fellow of the APA. Secondly, it is agreed that there should be a three-year time limit on a Student Affiliateship, provided, however, that a Student Affiliate may reapply for Affiliateship for a second

three-year period if at the end of the first three years he is not eligible for Associate Membership. This recommendation, it is to be noted, does not preclude a Student Affiliate applying at any time, as soon as eligible, for Associate Membership.

The new constitution of the APA provides that the Committee on Student Affiliates shall add student representatives to its own membership. The Committee has agreed that four Student Affiliates shall be added at the present time to make a total committee of nine members. The student members are to be designated by the APA members of the Committee, with each such member, except for the chairman, to select a student who will be in his vicinity during the year. The students selected are not restricted to the institutions of the committee members; but the plan is to select student representatives on the committee who will be located sufficiently near the APA members that they can be in close touch with each other.

The formation of specific plans and of a more detailed program of activities for Student Affiliates was considered at the September meeting of the Committee in Philadelphia. Departmental chairmen and students majoring in psychology will be informed of these developments at an early date.

The first class of Student Affiliates consists of about 125 students studying in more than 30 colleges and universities. This number represents only a small fraction of the potential Student Affiliate membership, but it is at the same time a very promising result for the first year of operation. The deadline for applications for next year's group is January 1, 1947. It is hoped that the next class will be considerably larger than this year's and that departments of psychology will encourage the formation of their Student Affiliates into actively working local groups.

Present Student Affiliates include the following:

Jack D. Adams, Ohio State University
Katherine P. Allen, Ohio State University
Dorothy G. Applezweig, University of Denver
Arleen G. H. Ascher, University of Connecticut

Howard D. Baker, Columbia University
 Beverly Balch, Smith College
 Clementine S. Barship, University of Maryland
 Sarah M. Bekker, University of Minnesota
 James R. Berkshire, Ohio State University
 Ralph Birne, New York University
 Libby Blek, Ohio State University
 Mary Louise Boice, University of Minnesota
 Margaret Anne Brown, University of Connecticut
 Ruthe Brown, University of Rochester
 Mary Lou Burkart, Pennsylvania College for
 Women
 Leroy S. Burwen, University of Chicago
 Richard G. Cannicott, University of Iowa
 Russel N. Cassel, Pennsylvania State College
 Dorothy M. Clendenen, Syracuse University
 William Coleman, Ohio State University
 Charles H. Cook, Clark University
 Genevieve Cosentini, Cornell University
 Arthur H. Davison, State University of Iowa
 Ivan Dosseff, Jr., University of Minnesota
 Joseph M. Doughty, Johns Hopkins University
 Edgar S. Ellman, Northwestern University
 Ellen Anne Elste, Clark University
 Leona M. Erickson, University of Minnesota
 Mylen E. Fitzwater, Ohio State University
 Max H. K. Forster, Purdue University
 Frederick C. Frick, Columbia University
 Vera M. Gatch, University of Oklahoma
 Frederick Gehlmann, University of Chicago
 Joan S. M. Gerver, Ohio State University
 Jacob L. Gewirtz, State University of Iowa
 Jack C. Gilchrist, University of California at Los
 Angeles
 Beverly E. Goldberg, University of Maryland
 Elaine Greenbaum, University of California at Los
 Angeles
 Nancy L. Griffin, Columbia University
 Charles E. Hamilton, State University of Iowa
 Marianne Hamilton, Pennsylvania College for
 Women
 Robert A. Harris, City College of New York
 Frances Haverstick, Pennsylvania College for
 Women
 Keith J. Hayes, Stanford University
 Eckhard H. Hess, Johns Hopkins University
 Thora Hickerson, State University of Iowa
 John A. Hornaday, Duke University
 Martha L. Howes, State University of Iowa

William P. Hurder, Ohio State University
 Kenneth S. Isaacs, University of Chicago
 Evelyn Jawitz, State University of Iowa
 Elmer R. John, University of Minnesota
 Harriet M. Jucken, University of Minnesota
 Henry C. Kogler, Jr., Syracuse University
 Harold Kramer, Harvard University
 Shirley Krasnoff, Ohio State University
 Mildred Kutner, Pennsylvania State College
 Robert G. Lanzit, Ohio State University
 Kathryn A. E. Lawler, Cornell University
 W. Richard Lawrence, AAF Psychology Program
 Bernard E. Lippman, University of Connecticut
 Arthur K. Littlefield, Boston University
 Leo M. MacLeod, Clark University
 Gerald B. Mailhot, Harvard University
 Beulah F. Matt, Pennsylvania State College
 Zeldah V. Matt, Purdue University
 Martha J. Maxwell, University of Maryland
 Fay E. Mayer, Pennsylvania State College
 Betty M. McKee, Pennsylvania College for Women
 Felice H. Melker, Ohio State University
 Dorothy P. Mitchell, University of Oklahoma
 Ailene Morris, University of North Carolina
 Joseph C. Nelson, University of Rochester
 Eugenia B. Norris, University of Wisconsin
 Edward H. Nowlan, Harvard University
 Stanley R. Ostrom, Syracuse University
 Jean T. Parker, Pennsylvania State College
 George E. Passey, Clark University
 Richard F. Paulson, State University of Iowa
 Hadassah Peres, University of Chicago
 Donald B. Peters, AAF Psychology Program
 Marilyn M. Pfingsten, University of Connecticut
 Evelyn Potechin, Ohio State University
 Shirley Power, University of Minnesota
 Esther Preger, New York University
 Margaret W. Raben, Columbia University
 William N. Reynolds, George Washington University
 Anne M. Ritter, Columbia University
 Elizabeth F. Robinson, State University of Iowa
 Julius Rosenthal, Johns Hopkins University
 Phyllis Rosner, University of North Carolina
 Miriam Rothenberg, State University of Iowa
 George E. Rowland, University of North Carolina
 Jerome D. Schein, University of Minnesota
 Eliezer Schneider, State University of Iowa
 Beatrice R. Schwartz, Western Reserve University
 Jane I. Seemans, University of Oklahoma

Kate Senior, University of Chicago
Edith D. Sherman, University of Chicago
Helenjane Shriner, Pennsylvania College for Women
Reuben J. Silver, Harvard University
Gloria Ann Silverstein, University of California at Los Angeles
Elinor Jane Slutz, Purdue University
William D. Small, U. S. Navy Medical Corps
Charlotte J. Smith, University of Wisconsin
F. Loren Smith, Oberlin College
Frances S. Stiles, State University of Iowa
Miriam E. Tate, University of Iowa
Ralph H. Tindall, Ohio State University
Mae Topp, Queens College

William A. Triebel, College of the City of New York
Alfred F. Trout, Boston University
Pauline S. Utman, University of Maryland
John R. Valley, Western Reserve University
Hugh N. Wallace, Syracuse University
June M. Weidner, Cornell University
Josephine S. Welch, University of Minnesota
Valentin J. T. Wertheimer, Oberlin College
Gerald S. Wieder, U. S. Navy
Dorothy M. Wilson, University of Washington
James W. Wilson, University of Rochester
Robert G. Wilson, Western Reserve University
Sam Wilson, Jr., Western Reserve University
Elmer R. Wingrove, Johns Hopkins University

JOHN GRAY PEATMAN, *Chairman*
Committee on Student Affiliates

Across the Secretary's Desk

PERSONNEL PLACEMENT IN THE APA

Before the establishment of the APA office, the business and financial details of the Association were handled in the offices of the Secretary and of the Treasurer; but there were no provisions for a placement service for psychologists. During the war, when the need for such a service became apparent, the Emergency Committee of the National Research Council set up an Office of Psychological Personnel.

Having begun primarily as a war agency, the Office of Psychological Personnel went out of existence with the end of the war. But since the OPP had been closely related to the APA, both because of its administrative officers and consultants and because of APA support, all of the OPP files were transferred directly to the APA office last January. Actually, the APA moved into the former OPP office and began its new life there. This may account for the confusion about the two offices. There is now no Office of Psychological Personnel. But the functions and responsibilities of that Office have been incorporated into the APA and there they have continued to thrive.

During the past several months we have received several hundred job requests. These have come to us by letter, telegram, local telephone, long distance telephone, and personal office call. They have come from colleges and universities, clinics and hospitals, guidance centers, business and industry, consulting firms, research organizations, and government agencies. They have ranged in specificity from a request for "someone to teach psychology" to "a young woman, happily married, well-adjusted, intelligent, master's degree and interested in working on the doctorate, experienced in interviewing and counseling, to do marriage counseling in the student personnel bureau of a large university." They have also varied from frantic requests for "a psychologist to substitute for one of our regular instructors who has just been taken seriously ill" to more indefinite but decorous statements of interest in possibilities for the chairmanship of a university department of

psychology or director of personnel research in a large corporation.

When a job request comes to the office, we give it a number—for the records—and then go to the "active job file" to try to find suitable applicants. The active file is made up of psychologists who have indicated an interest in obtaining a new position. In order to help us function efficiently, they have filled out a standard registration form, giving essential information about themselves. Age, marital status, educational background, fields of specialization, interests, occupational background, duties performed, salary received, kind of work preferred, salary desired, and any other pertinent facts are included. Most of them have also had rating forms on personal characteristics sent in by their three references. From this file, then, we are able to select applicants whose qualifications and job preferences seem to make them fit the particular job request. The number of suitable registrants for each job varies, of course. For positions requiring rather unusual specialized training, the files may yield only a few, sometimes no, applicants. In other cases we have many registrants in the file who appear to be suitable.

A list of the registrants selected in this way is then sent to the prospective employer. He looks over the summary of qualifications of each applicant, which accompanies the list, and communicates directly with those whom he wishes to investigate further. Ordinarily we do not inform the registrant when his name has been referred, although we do note on his record each referral made.

Once we have brought the employer and the applicant together, our part in the process is essentially complete. From that point, the protagonists must carry on alone. However, in this system it is important that we know the outcome of the story. Otherwise, we find ourselves referring psychologists who no longer want jobs for positions which already have been filled.

The *modus operandi* of the placement service is not static. As needs of psychologists and their employers change, we intend to change the details of office procedure. If so requested, we are glad to publish announcements of psychological positions—not as want ads but as items of news interest—in THIS JOURNAL.

To call this activity a placement service may, indeed, raise an inaccurate connotation. The APA acts as a clearing house for information about psychologists and about employers looking for psychologists. We refer, but we do not recommend. We do not attempt to give the usual services of an

employment agency. Although, naturally, we are pleased if we have been the link which brought the employer and employee together, we do not urge either the employer or the applicant to make a decision. And, unlike an employment agency, we do not charge either the employer or the applicant for the service.

In this way we have attempted to set up in the APA office an efficient and democratic means of carrying out the stipulation in the 1945 By-Laws that one of the functions of the office should be the "facilitation of personnel placement"—LORRAINE BOUTHILET.

Psychological Notes and News

CALL FOR PAPERS: Section I of the American Association for the Advancement of Science will meet in Boston Saturday and Sunday, December 28 and 29, and possibly Monday, the 30th. Members of the section wishing to present papers should send abstracts to the Secretary, Harold E. Burtt, Department of Psychology, Ohio State University, Columbus 10, Ohio. Abstracts should be in triplicate, not over 200 words, and will not be considered if they are received after September 21. If slides, charts, or blackboard are necessary, a statement to that effect should appear at the end of the abstract. In the case of slides, please specify whether standard or 2 x 2 size. Motion pictures will not be shown.

The Council of Representatives of the APA announces that LAURANCE F. SHAFFER has been elected editor of the *Journal of Consulting Psychology*, effective January 1, 1947, and that HERBERT S. CONRAD has been reelected editor of the *Applied Psychology Monographs*.

The New Jersey Psychological Association will hold its fall meeting at the Hotel Brighton, Atlantic City, November 9. The morning session will consist of a symposium on *The Psychology of the Handicapped Child*. LLOYD N. YEPSEN will be the speaker at the luncheon meeting. In the afternoon the group will meet with the New Jersey Education Association. At the spring meeting at Rutgers University May 25 the following officers were elected: ROBERT M. BEECHLEY, President; HELEN M. RICHARDSON, vice-president; LOUISE E. ALTENEDER, secretary-treasurer; HELMER MYKLEBUST and MARGARET T. MOLDASCHI, members of the executive committee. The program of the morning consisted of a visit to the Rutgers University Veterans' Guidance Center. In the afternoon GEORGE KELLY described the program of the Veterans Administration.

In a Joint Resolution the Congress authorized United States membership in UNESCO. President Truman made the following statement on this resolution:

I am gratified that Congress has passed the Joint Resolution authorizing me to accept

membership for the United States in the United Nations Educational, Scientific and Cultural Organization. I attach the greatest importance to this agency.

UNESCO will summon to service in the cause of peace the forces of education, science, learning and the creative arts, and the agencies of the film, the radio and the printed word through which knowledge and ideas are diffused among mankind.

The government of the United States will work with and through UNESCO to the end that the minds of all men may be freed from ignorance, prejudice, suspicion and fear, and that men may be educated for justice, liberty and peace. If peace is to endure, education must establish the moral unity of mankind.

R. EDWARD BERMAN, Director, and SHELDON J. LACHMAN, Associate Director, announce the opening of a Psychological Consultation Service at 309 Broadway Market Building, 1377 Broadway Avenue, Detroit 26, Michigan.

ARTHUR W. MELTON will join the staff of the psychology department at the Ohio State University in October. Lt. Col. Melton has been chief of the psychology section, School of Aviation Medicine, San Antonio, Texas, and was formerly chairman of the department of psychology at the University of Missouri. At the same time DELOS D. WICKENS will join the Ohio State University Staff as an associate professor. Dr. Wickens was formerly at the University of Wisconsin. During the war period he was engaged on a government project on naval training.

KATHARINE M. BANHAM has been appointed an associate professor of psychology at Duke University.

HOWARD GRAY MARTIN left the staff of the Prison Guidance Center, San Quentin, California on September 1 to accept a position as Associate Psychologist with the firm of Psychological Consultants, Inc., of San Francisco.

ISIDOR CHEIN, formerly on the staff of the College of the City of New York, has been appointed Research Associate on the staff of the Commission on Community Interrelations of the American Jewish Congress.

GLEN L. HEATHERS joined the staff of the Social Science Research Council August 1.

ARTHUR BURTON has been appointed associate professor of psychology and director of the University Guidance Center at the University of Idaho, Southern Branch, Pocatello, Idaho.

DAVID RAPAPORT has been appointed to the newly created position of Director of Research at the Menninger Clinic, Topeka, Kansas. MARGARET BRENNAN has succeeded him as head of the psychology department. SIBYLLE ESCALONA is now assistant head of the department.

CARROLL C. PRATT, formerly chairman of the department of psychology at Rutgers University and now on an exchange professorship at Ankara, Turkey, has been appointed professor of psychology at Princeton University. He will assume his new duties in September, 1947.

KENNETH L. SMOKE has been appointed professor of psychology at Gettysburg College. He was formerly professor of psychology at Juniata College.

DEAN A. WORCESTER has returned to his position as professor of educational psychology and measurements at the University of Nebraska after nine months at the American University at Biarritz, France and two months in educational and counseling work with the U. S. Army in Germany.

T. ERNEST NEWLAND has been commissioned as a Lieutenant Colonel for duty as Associate Director of the newly-created Department of Military Psychology and Leadership in the Department of Tactics at the U. S. Military Academy, West Point, New York. Lt. Col. Newland served during the war as commander, USNR with the Office of the Chief of Naval Communications in Washington, D. C. He has resigned from the position of Chief of Special Education in the Pennsylvania Department of Public Instruction.

ZED H. BURNS has been appointed head of the department of education and psychology, and director of guidance at North Georgia College,

Dahlonega, Georgia. Dr. Burns, who was formerly at Clemson College, served during the war as a personnel consultant in the Adjutant General's Department and as an aviation psychologist in the Army Air Forces.

HAROLD K. FINK has become assistant director of the Reeducation Center, 113 West 57th Street, New York 19, New York, of which GRACE T. LAPHAM is director. Dr. Fink is head of the Psychological Services Division. CHARLOTTE PIEZ has also joined the staff as psychometrician in charge of the Testing Department.

L. DEWEY ANDERSON of the Department of Commerce and MORRIS S. VITELES of the University of Pennsylvania left August 14th for a mission to Germany to survey wartime developments in the selection and training of industrial personnel and other aspects of industrial psychology and personnel management. They will be joined later by ALFRED B. KAHLER of the New School for Social Research and others. The mission is sponsored by the Technical Industrial Intelligence Branch of the Department of Commerce.

GEORGENE H. SEWARD has been appointed assistant professor of psychology and supervisor of the Counseling and Testing Division of the Psycho-Educational Clinic at the University of Southern California.

The Division of Clinical Psychology, Neuropsychiatric Service, Veterans Administration, announces the following appointments in the clinical psychology program of the Veterans Administration:

Branch Chief Clinical Psychologists and Assistant Branch Chief Clinical Psychologists: CARL L. ALTMAIER, JR., Assistant Branch Chief, New York; JAMES Q. HOLSOOPPLE, Branch Chief, Philadelphia; DONALD K. ADAMS, Branch Chief and JAMES W. LAYMAN, Assistant Branch Chief, Atlanta; E. LOWELL KELLY, Branch Chief, Columbus, Ohio; DAVID SHAKOW, Branch Chief, Chicago; and HAROLD M. SKEELS, Assistant Branch Chief, Denver. Drs. Adams, Kelly, and Shakow are on part-time appointment and will continue their academic duties at Duke, Michigan and Illinois respectively. Dr. Holsopple will be on full time duty, but will continue his academic connection with Princeton. The others are devoting full time to the Veterans Administration program.

On duty in Regional Offices—Mental Hygiene Clinics: ROBERT M. HUGHES, Atlanta; HERMAN MOLISH and SOL CHAREN, Baltimore; EDWARD BURCHARD, BENJAMIN KOTKOV, JOHN T. EVANS, and JEROME SPELLMAN, Boston; PAUL C. GREEN and RICHARD S. BALL, Chicago; HENRY S. CURTIS and BENJAMIN BRODY, Cleveland; W. H. MIKESELL and DAVID B. FICKS, Denver; FREDERICK E. ASH, Des Moines; FRANK J. KIRKNER, MORTIMER MEYER, and WILLIAM SINGER, Los Angeles; SAMUEL KUTASH and LOUIS DELMAN, Newark; HELEN CAMPBELL, HERBERT J. ZUCKER, LESTER GLIEDMAN, ELIAS KATZ, BERNARD LOCKE, MORRIS I. STEIN, KENNETH A. FISHER, THOMAS M. JOHNSON, HENRY KAVKEWITZ, and MILTON THEAMAN, New York City; EDWARD W. SLOCKBOWER, Philadelphia; ROY HAMLIN and WILLIAM S. KOGAN, Pittsburgh; JULES D. HOLZBERG, Providence, R. I.; EDWARD W. ARLUCK, St. Louis; JAMES A. CHRISTENSON, Jr., St. Petersburg; JEROME FISHER, San Francisco; ALFRED CORNSWEET, JACOB V. GOLDER (detailed to the Central office), and ROBERT MACGREGOR, Washington, D. C.

On duty in Neuropsychiatric Hospitals: GORDON A. JONES, American Lake, Wash.; NORMAN T. BOWES, Bedford, Mass.; DONALD A. GORHAM (part time), PHILIP W. MORSE, and S. FRED HAUSER, Canandaigua, N. Y.; RONALD M. WOLFE and ROBERT E. JONES, Chillicothe, O.; GEORGE A. W. STOUFFER, Jr., Coatesville, Pa.; HAROLD FELDMAN, Ft. Lyon, Colo.; RALPH T. HINTON, Gulfport, Miss.; HARRY D. HYMAN, BERT D. SCHWARTZ and PHILLIP GOLDBERG, Lyons, N. J.; WILLIAM C. MURPHY, Marion, Ind.; SOL GARFIELD, Mendota, Wis.; PHILIP S. HENDERSON, Murfreesboro, Tenn.; ISADORE SCHERER, Northampton, Mass.; EARL E. SWARTZLANDER and ULRICH SONNEMANN, Northport, Long Island, N. Y.; ROBERT E. KANTOR, Palo Alto, Cal.; MARION STOTZ, Perry Point, Md.; MARGARET ELLIOTT, Roanoke, Va.; WILLIAM M. HALES, St. Cloud, Minn.; ROBERT CHALLMAN, ROBERT R. HOLT, MICHAEL B. DUNN, and MILTON WEXLER, Topeka, Kan.; WILLIAM G. HANDORF, Tuscaloosa, Ala.; JAMES T. MORTON, Jr., Tuskegee, Ala.; and ROBERT B. MORTON, Waco, Texas.

On duty in General Medical and Surgical hospitals: HOWARD W. GOODMAN, Aspinwall, Pa.; HERMAN SCHMIDT, Batavia, N. Y.; ROBERT ALLEN, JEROME KOSSEFF, HERMAN WEISS, and JOSEPH N. FEUERBURGH, Bronx, N. Y.; C. W. MILES and

LEAH M. LOERHKE, Cleveland, Ohio (Crile Hospital); SCOTT T. BOWERS, Dayton, Ohio; ROY BRENER, HUGH TORRENCE, IRWIN M. BLOOM, and DAVID GRAUER, Hines, Ill.; WILLIAM D. SMALL, Jefferson Barracks, Mo.; LEON I. HELLMAN, Los Angeles, Cal.; SHERMAN N. KIEFFER, Minneapolis, Minn.; ROBERT P. BARRELL, Richmond, Va.; HAROLD H. PRINCENTHAL, San Francisco, Cal.; and SAM GROB, West Roxbury, Mass.

ARTHUR W. SHERMAN, Jr. and JAMES H. L. ROACH have been appointed acting instructors in psychology and vocational appraisers at Ohio University.

The Committee on the Training of Clinical Psychologists announces that HELEN CORBETT, Teachers College, LEONARD ERON, Columbia University, MATHILDE HEUMANN, N.Y.U., and NATALIE KAUFMAN, C.C.N.Y. have been awarded fellowships in clinical psychology for the academic year 1946-1947. The fellowships are on a rotating basis, with the New York Board of Education Child Guidance Bureau, the Bellevue Hospital Psychiatric Department, the Neurological Institute, and the Brooklyn Guidance Center being the cooperating agencies.

Internship training in the application of psychological methods to the prediction of vocational adjustment is offered in the Vocational Counseling Division of the Prison Guidance Center at San Quentin, California. The salary is \$75 a month for which 22 hours of work per week is required. Registration in a graduate curriculum in psychology or education is required. Graduate credit may be arranged at nearby universities. Those interested should write to Howard Gray Martin, Prison Guidance Center, San Quentin, California.

An appointment as assistant psychologist at the Louisville Mental Hygiene Clinic and the Department of Psychiatry of Louisville Medical School is available. The position provides the opportunity of doing clinical psychological work in a variety of fields under the supervision of the chief psychologist and of collaborating in research projects which are under way. Previous clinical experience is desirable but not necessary. A young Ph.D. or an advanced graduate student could be appointed. The stipend is \$2400. Interested individuals are invited to write to Dr. S. Spafford Ackerly, Director, Louisville Mental Hygiene Clinic, 610 South Floyd Street, Louisville 2, Kentucky.

Convention Calendar

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

Date: September 4-7, 1946

Place: University of Pennsylvania
Philadelphia, Pennsylvania

For information write to:

Dr. Dael Wolfle, Executive Secretary
American Psychological Association
2101 Constitution Avenue, N. W.
Washington 25, D. C.

ROCKY MOUNTAIN BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

Date: May, 1947

Place: Colorado College
Colorado Springs, Colorado

For information write to:

Dr. Lillian G. Portenier
Department of Psychology
University of Wyoming
Laramie, Wyoming

PSYCHOMETRIC SOCIETY

Date: September 4-7, 1946

Place: University of Pennsylvania
Philadelphia, Pennsylvania

For information write to:

Dr. Harold A. Edgerton
Occupational Opportunities Service
The Ohio State University
Columbus 10, Ohio

AMERICAN ASSOCIATION ON MENTAL DEFICIENCY, INC.

Date: October 2-5, 1946

Place: Hotel Mt. Royal
Montreal, Quebec, Canada

For information write to:

Dr. Neil A. Dayton
Mansfield Training School
Mansfield Depot, Connecticut

THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY

Date: April 4-5, 1947

Place: St. Louis, Missouri

For information write to:

Dr. Joseph Weitz
Sophie Newcomb College, Tulane University
New Orleans, Louisiana

SOUTHWESTERN PSYCHOLOGICAL ASSOCIATION

Date: April 4-5, 1947

Place: Dallas, Texas

For information write to:

Dr. L. B. Hoisington
Department of Psychology
University of Oklahoma
Norman, Oklahoma

ILLINOIS ASSOCIATION FOR APPLIED PSYCHOLOGY

Date: October, 1946

Place: Chicago, Illinois

For information write to:

Dr. Milton A. Saffir
55 East Washington St., Room 1607
Chicago 2, Illinois

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